CALIFORNIA

OIL WORLD

TWICE MONTHLY • SECOND ISSUE • MAY 1949

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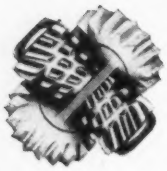

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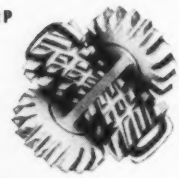

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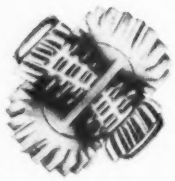

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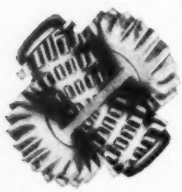

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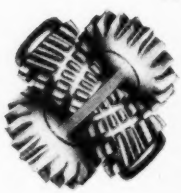

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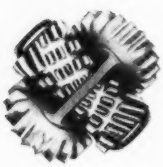

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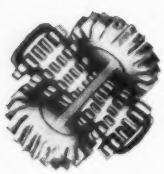

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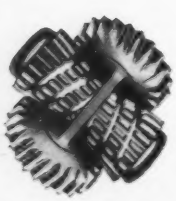

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CALIFORNIA
OIL WORLD

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May 31, 1949
Telephone FAirfax 6218

Washington Highlights

Motorists used 30,646,486,000 gallons of gasoline during 1948 and paid taxes of 1,082,675,690. States collected $1,342,973,000 in gasoline taxes and the Federal Government $459,702,690. According to the Federal Works Agency, gasoline consumption was eight per cent above the amount burned in 1947. It was explained that the 1948 gallonage does not include 4,598,301,000 gallons on which tax either was not paid or was paid at a reduced rate because the fuel was used for Government or non-highway purposes. The greatest percentage of increase in motor fuel consumption was recorded in West Virginia, where 16.6 per cent more was used in 1948 than in the year preceding. California led all states in amount of taxable fuel used represented by 2,846,781,000 gallons. This was a rise of 106,875,000 gallons over 1947. The average gasoline tax a gallon in all states was 4.35 cents last year against an average tax of 4.25 cents in 1947. Taxes on gasoline ranged from 2 cents in Missouri to 9 cents in Louisiana. Federal tax is 1½ cents a gallon.

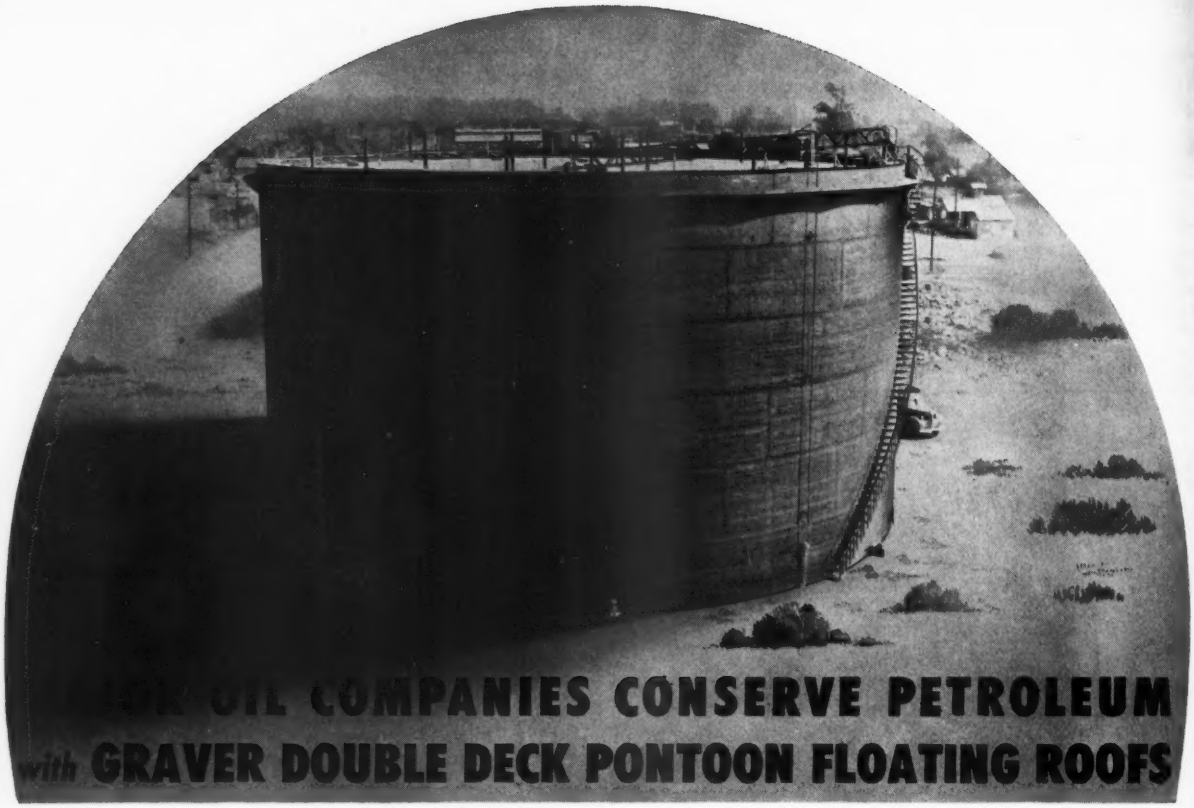
Robert Friedman, acting director of the Oil and Gas Division of the Department of Interior, has indicated that he will not accept appointment as Director of the Division. He has submitted his resignation to Secretary Julius A. Krug. The National Petroleum Council in recent weeks adopted a resolution urging Secretary Krug to name Friedman as director.

Problems which might face the pipeline industry in event of war in the future will be the subject of a comprehensive survey. Capt. Granville Conway, director, National Security Resources Board, Office of Transport and Storage, has named a task group to make the survey.

The Supreme Court has taken under advisement the request of Attorney General Clark for permission to sue for Federal ownership of Texas and Louisiana tidelands. Texas Attorney General Price Daniel closed the case for the states with a plea to the high court to withhold its decision until Congress can act on pending legislation to determine ownership of tidelands. Daniel called attention to the fact that Congress might define a national policy on the issue and thus settle the matter permanently. A number of bills are before Congress to determine whether th Federal Government or the states have ownership of the marginal lands lying along the coast. Daniel joined attorneys for the Pelican State in insisting that the ownership suit by the Government first shoud be filed in the lower courts and carried to the high bench only on appeal. He contended that the Government has no power to institute suit before the Supreme Court. Attorney General Bolivar E. Kemp, Jr., of Louisiana, argued that Louisiana is a sovereign state and cannot be sued without its consent. Phillip Perlman, U. S. Solicitor General, termed the states' rights argument "frivolous." Trowbridge Bomauer, another one of Louisiana's lawyers, pointed out that while California has consented to come to the Supreme Court for the suit, his state has not consented. "Thus," he declared, "the Government is seeking to drag Louisiana into the high court in violation of its constitution."

The Pennsylvania Grade Crude Oil Association has submitted a proposal to the Armed Service Petroleum Board calling for stockpiling of lubricating oils by the Government. The proposal was in the form of a brief prepared by J. P. Jones of Bradford, Pa., association director of production. Stockpiling was analyzed by the association as relieving abnormal market conditions which threaten to cause loss of reserves of millions of barrels of Pennsylvania oil through premature abandonment of wells. Lubricating oil components could be purchased now at considerable saving to the Government, it was said.

The Armed Services Petroleum Purchasing Agency has made known that bids will be opened for aviation fuel requirements for the period from July 1 to December 31. This action marks the first time since before the war that military authorities have viewed supplies of aviation fuels as in a quantity sufficient to allow the return of competitive bids.



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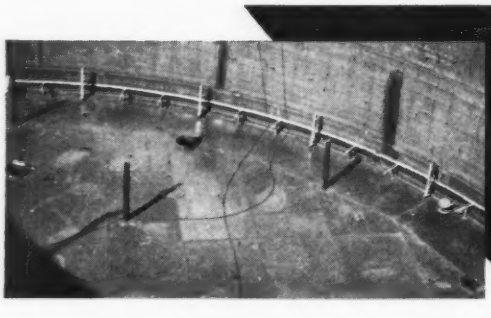

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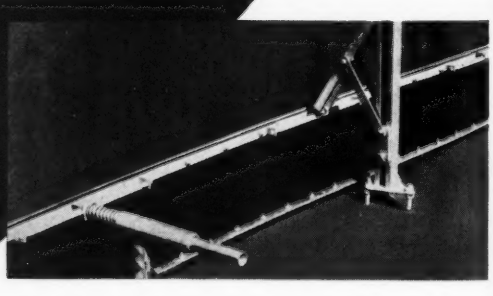

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A Critical Analysis of Methods of Determination of Water Dew Point in Hydrocarbon Gases

ABSTRACT

The authors have found that the values obtained from conventional dew point determination apparatus do not give true results when used on gases effluent from liquid dehydraters. A theoretical explanation for this phenomenon and a description of a method for determining the absolute water content of gases from this type of dehydrater will be offered. Particular emphasis will be placed upon the phenomena observed when the Bureau of Mines dew point indicator is used and upon the lack of significance and reproductibility of the results obtained. Reference is also made to a lack of correlation of the indicated water content with the hydrate formation temperature of such gases.

by
Fred C. Riesenfeld,
Research Chemist
and
Henry D. Frazier,
Research Chemical Engineer
of
The Fluor Corporation, Ltd.

May Meeting

Many processes through which natural gas must pass on its way from the well to its ultimate use are in some way affected by its water content. Some of these processes are gas compression, absorption of gasoline, certain catalytic conversions, low temperature fractionation, acid gas removal, dehydration, and transmission in pipe lines. In many of these processes a high water content causes considerable difculty, such as corrosion and plugging of lines due to the formation of ice and hydrocarbon hydrates. The prevention of hydrate formation is of particular importance in the operation of gas transmission lines, the number of which has increased considerably during recent years. Most of these lines are operated at relatively high pressures and subjected to wide variations of temperature, conditions which are conducive to the formation of hydrates.

Because of the considerable importance of the control of water content of gas streams, and the wide applicability thereof as just outlined, there are a great many installations in operation which reduce such water content to some degree. The successful control of such operations depends upon suitable methods for determining the water content of the treated gas stream, and it is the purpose of this paper to discuss such methods and their significance.

The reduction of the water content of natural gas has been accomplished in general by three methods. One of these methods consists of the use of solid absorbents such as calcium chloride, lithium chloride, magnesium perchlorate, calcium sulfate and others. These materials, in general are non-regenerable in place and must be removed from the contact vessel and regenerated or discarded.

The second type of dehydration process utilizes solid absorbents, such as activated alumina and silica gel. These materials are somewhat more economical in large operations since they can be regenerated in place by the use of high temperature gas or steam.

The third type of dehydration process, which at present is most widely used in large operations, employs hygroscopic organic liquids such as diethylene glycol, or diethylene glycol-ethanolamine mixtures. Diethylene glycol is used where dehydration alone is needed and glycol-amine mixtures where acid gas removal is desired in the same operation.

Any of the dehydration processes requires analytical control and a number of methods and instruments have been developed to give an indication of the water content of the treated gas.

Two types of these instruments are so designed that the actual operation is intended to give an indication of the temperature and pressure at which the first liquid water will drop out of the gas. This temperature and pressure is commonly referred to as the dew point. Before the advent of liquid dehydrating processes this dew point could be used without further interpretation in cases involving the temperature of formation of natural gas hydrates since the latter cannot form without liquid or solid water present, even though the temperature be below the hydrate formation point. For this reason we find the efficiency of dehydrating processes expressed in terms of "dew point depression."

One such type of instrument maintains a constant system pressure and manipulation involves the lowering of the temperature to the point of formation of a visible film or droplets on a highly polished cool surface. The temperature at which the first darkening of the surface occurs is taken as the dew point. This kind of instrument may be referred to as the "temperature variant type." The most commonly used instrument of this type is the Bureau of Mines apparatus for determining the dew point of gases under pressure, described by W.M. Deaton and E. M. Frost, Jr., [3] (Fig. 1).

Another such type of instrument for the determination of the dew point or water content utilizes an essentially adiabatic expansion from a predetermined pressure and ambient temperature to produce a visible fog in the gas when the predetermined pressure has been set just above the dew point pressure. This type can be referred to as the "pressure variant type" in that it determines a pressure at which a liquid phase will form at the temperature of the cell.

A good many methods may be placed in a third class. These include types which rely upon some property of water, other than the condensation phenomenon, which is different from the properties of the other compounds present. Todd and Gauger[13] offer a method in which

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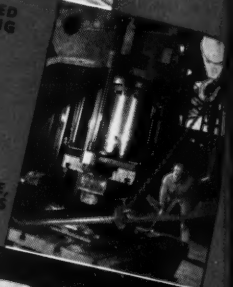
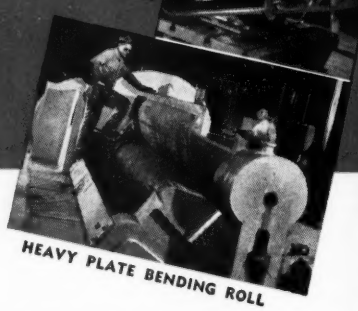


400-TON GAP TYPE HYDRAULIC PRESS



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the water content of gas is determined by infracted spectroscopy. Dunmore[4, 5] and Weaver and Riley[14] describe procedures utilizing the variation in electrical conductivity of a hygroscopic film with varying amounts of water absorbed at different water partial pressures in the gas. Several methods involving chemical reactions specific for water are reported in the literature. Among the chemicals used are cobalt bromide[9], Karl Fischer[6] reagent, which consists of a methyl alcohol solution of iodine, sulfur dioxide and pyridine, magnesium nitride [10] and a mixture of acetyl chloride and pyridine [12, 7]. Russell, Reid and Huntington [11] in their work on vapor-liquid equilibria between natural gas and 95% diethylene glycol absorb water and glycol vapor on anhydrous magnesium perchlorate and determine the glycol separately by oxidation with potassium dichromate.

All of these instruments and methods are quite satisfactory for most gas streams which have been dehydrated by means of the first two methods previously mentioned above. However, if the gas has been treated with glycol or glycol-amine mixtures these methods may not give results capable of interpretation in terms of true water content.

The electrical conductivity type instrument may be used with some degree of success on gas streams contacting diethylene glycol only but it is not usable on those effluent from glycol-amine dehydrating plants, since amines are also conductors of electricity.

This discussion is directed primarily toward the pressure variant and the temperature variant types of instruments, since they are in the most common use in the field. Since the phenomenon encountered in their use on liquid dehydrated gas streams is essentially the same with either type of instrument, we will use the temperature variant type—in particular the Bureau of Mines dew point indicator—as an example. The instrument does not yield a true water dew point and the value obtained is not accurately indicative of the water content of a gas which has been in equilibrium contact with a diethylene glycol or diethylene glycol-monoethanolamine containing solution.

The reason for this conclusion is based on the following theoretical considerations. The gas leaving the top of the contactor of a glycol or glycol-amine plant has approached equilibrium with the solution at the top tray, and is therefore essentially saturated with a mixture of glycol, amine and water vapors in proportion to their respective partial pressures at the pressure and temperature conditions prevailing at this point; any change in temperature or pressure will disturb this equilibrium. If the temperature of the gas stream is lowered an infinitesimal amount under true equilibrium conditions, a small quantity of liquid of essentially the same composition as that which the gas last contacted will condense. Thus, in the customary use of the dew point indicator a film of liquid will appear on the mirror at some temperature lower than the equilibrium temperature at the top of the contactor. The temperature at which this liquid becomes visible to the eye of the operator will depend to a great extent upon the the rate of cooling and technical manipulation, particularly since such systems may be subject to super-cooling, but in no event can this liquid consist solely of water, since it will always contain the components of the liquid treating system—glycol, amine and water, or glycol and water. Since this condition prevails, it is quite obvious that the observed so-called "dew point" obtained is not an index of the water content of the gas stream and cannot be made to be such, since under properly controlled equilibrium conditions for making such measurements, liquid will condense

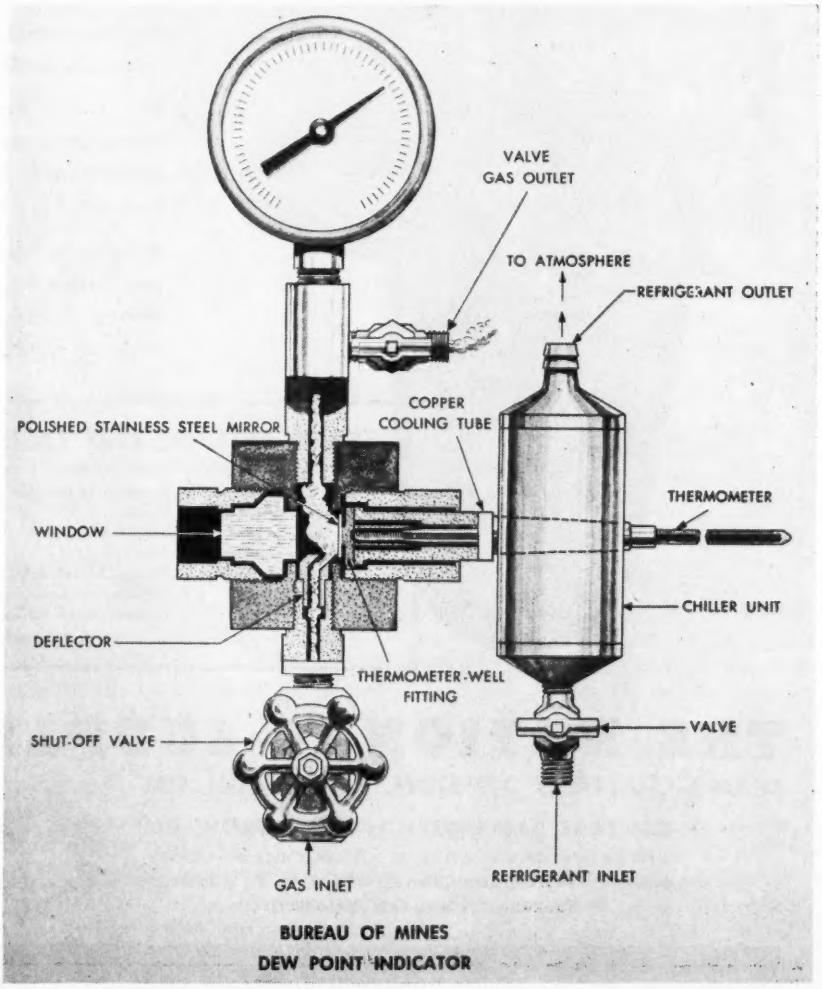

Figure 1

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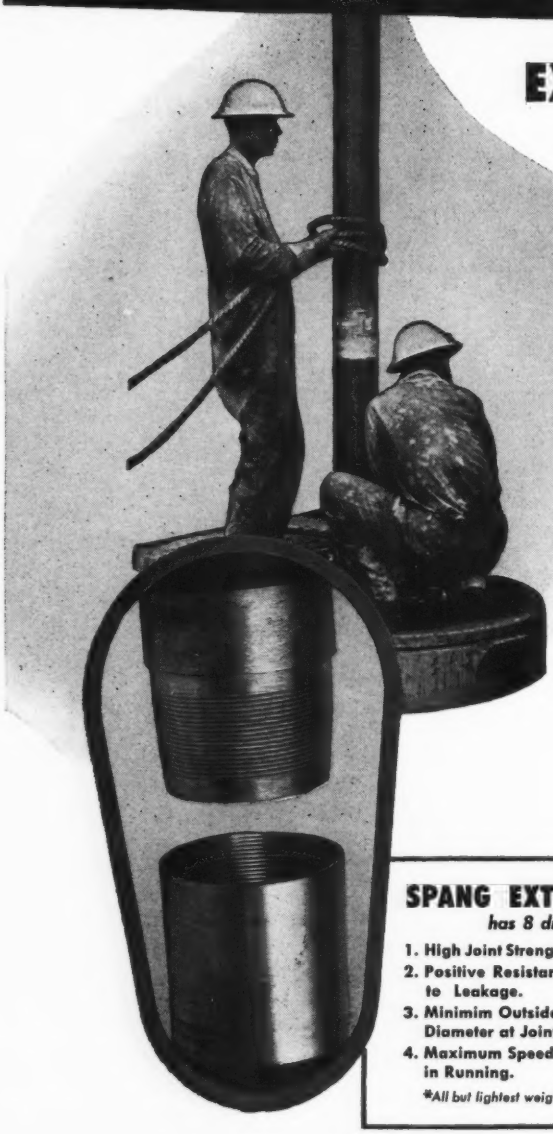
EXTREME LINE CASING



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*All but lightest weights of a size will pass the A.P.I. drift.

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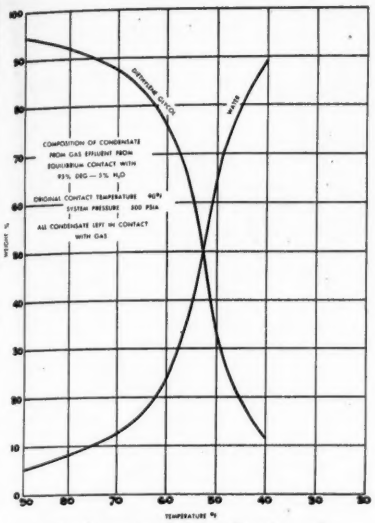

DIETHYLENE GLYCOL
WATER
COMPOSITION OF CONDENSATE FROM GAS EFFLUENT FROM EQUILIBRIUM CONTACT WITH 95% DEG — 5% H2O
ORIGINAL CONTACT TEMPERATURE 90°F
SYSTEM PRESSURE 500 PSIA
ALL CONDENSATE LEFT IN CONTACT WITH GAS
WEIGHT %
TEMPERATURE °F

Condensate Due to Cooling of Dehydrated Gas

Figure 2

continuously on the mirror of the apparatus as the temperature is lowered, and this condensate will have a continuously varying composition. The first material condensed will have very little water and be mainly glycol and amine. This liquid does not readily form a fog but is likely to spread evenly over large areas of the mirror and be unnoticed during the first phases of the operation.

Fig. 2 shows the variation of the composition of the material which will constitute the liquid phase on the surface of a mirror which is being cooled in a stream of gas which has been passed through a glycol-water dehydration system utilizing a solution of 95% diethylene glycol, 5% water operating at a contact temperature of 90°F., and a pressure of 500 psia.

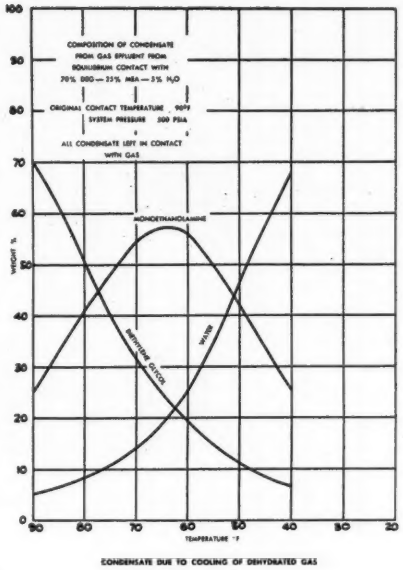
Fig. 3 shows the same data for a dehydrater solution containing 70% diethylene glycol, 25% monoethanolamine and 5% water. These curves were arrived at by equilibrium condensation calculations in 5-10°F. intervals. They indicate quite clearly that in such systems a gradual condensing of liquids of steadily changing composition occurs as the temperature is lowered. It is therefore apparent that no distinct water dew point, dew point of any pure liquid, or liquid mixture exists unless the original contact temperature is considered to be the dew point. Several references[3, 11] have been made in the literature to the difficulties encountered in using these dew point indicators and some special techniques have been proposed to make possible some sort of useful indication with them, but all such attempts are simply compromises in an attempt to get an indication without regard for the fact that such an indication is theoretically inaccurate.

In the light of the above considerations, data have been obtained in this laboratory and in the field in an attempt to determine the absolute water content of hydrocarbon gas streams effluent from such dehydraters. The method finally adopted for this work was based on the method proposed by Russell, Reid and Huntington[11], with slight corrections.

The equipment required for the method is shown schematically in Fig. 4. It consists of a sample valve, S.V., on the gas line to be sampled, followed by a water or steam bath, W.B., for the purpose of heating the gas before dropping the pressure into the absorption system. Following this water bath are the two absorption trains.

The first absorption train, for the removal of total vaporized liquid, consists of the valve V_1, preferably a 1/8" needle valve, the two glass absorption tubes A_1 and A_2, and the wet test meter WTM_1. The absorption tubes A_1 and A_2 are glass U tubes 100 mm long and 15 mm inside diameter with stopcocks at the inlet and outlet ends.

The second absorption train, for the removal of amine, consists of the valve V_2, also a 1/8" needle valve, the absorption tube A_3 and the wet test meter WTM_2. The absorption tube, A_3, is a large test tube closed with a two-hole neoprene stopper carrying the gas inlet and outlet tubes. The gas inlet consists of a small fritted glass gas dispersion tube of 20 mm diameter, such as manufactured by the Corning Glass Works; extra coarse plates (Type EC) are preferably used in order to prevent too high a pressure drop across the plate. An absorption bottle such as described by the California Natural Gasoline Association[1] can also be used advantageously. Any suitable gas meter calibrated to 0.001 cubic foot or 0.01 liter can be used for the measurement of the effluent gas, although a wet test meter is recommended.


COMPOSITION OF CONDENSATE FROM GAS EFFLUENT FROM EQUILIBRIUM CONTACT WITH 70% DEG — 25% MEA — 5% H2O
ORIGINAL CONTACT TEMPERATURE 90°F
SYSTEM PRESSURE 500 PSIA
ALL CONDENSATE LEFT IN CONTACT WITH GAS
MONOETHANOLAMINE
DIETHYLENE GLYCOL
WATER
WEIGHT %
TEMPERATURE °F

CONDENSATE DUE TO COOLING OF DEHYDRATED GAS

Figure 3

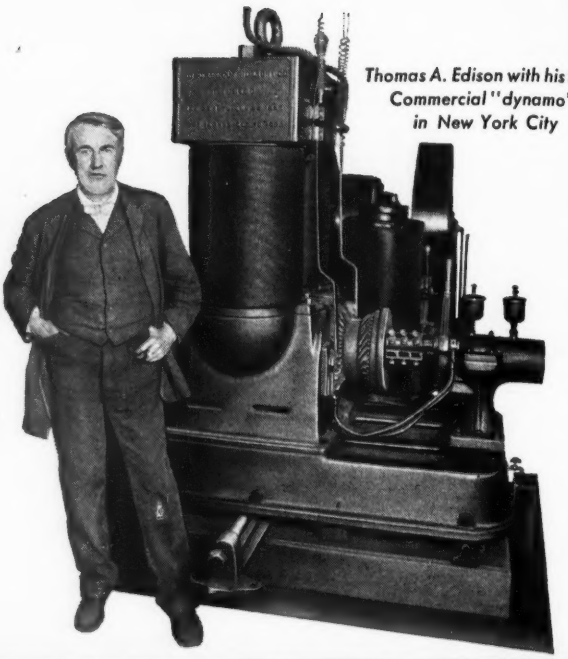
The necessary reagents are:

Anhydrous magnesium perchlorate (Anhydrone)
0.02 N Sodium Hydroxide
0.02 N Sulfuric Acid
Methyl red indicator (0.1% water)

Determination of Total Vaporized Liquid

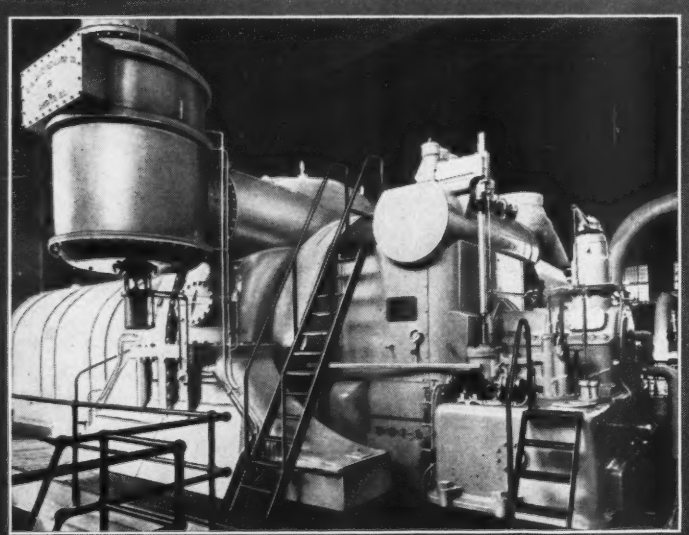
The two absorption tubes A_1 and A_2 are filled with anhydrous magnesium perchlorate and purged with gas for a period of 15 minutes. This is necessary to saturate the magnesium perchlorate with hydrocarbon and thus to prevent erroneous results caused by hydrocarbon absorption. The tubes are then weighed on an analytical balance to an accuracy of 0.1 milligram and subsequently placed on the line in the same order as when purged; A_1 is connected to V_1 and A_2 to WTM_1; the connections should be made with short lengths of neoprene tubing. The flow is started by opening valves S.V. and V_1; S.V. should be opened several turns so that full line pressure is maintained through the water bath to valve V_1, which is used as a throttling valve for flow rate control. The flow should be regulated so that a maximum of 6 cubic feet per hour is maintained. After passage of a maximum total of 18 cubic feet, the gas is shut off, the tubes disconnected and again weighed on the analytical balance.

The Wizard of Watts



Thomas A. Edison with his First Commercial "dynamo" in New York City

Petroleum Progress helps carry his great work forward



Edison's first "dynamo plant" brought electric "lamps" to a small handful of customers. In today's great turbo-generators, enormous rotors whirl at terrific speed to produce as much as 200,000 electrical horsepower—enough to power and light a city. Petroleum industry research has helped make dependable steam turbine operation possible by providing the correct type of lubricants to meet the severe requirements—a field in which Texaco has played a leading part.

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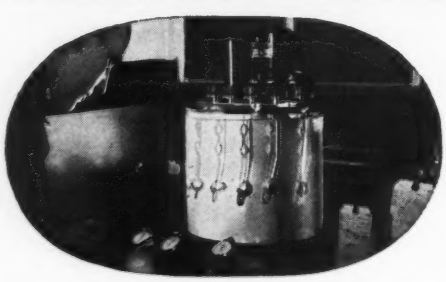

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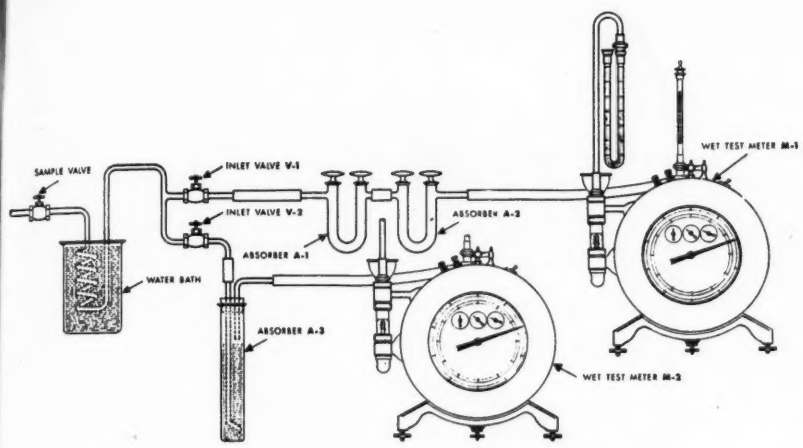


ASSEMBLED ABSORPTION APPARATUS
Figure 4

If the analysis is run properly, the increase of weight of the second absorption tube should not exceed 5% of the increase in weight of the first tube.

Determination of Amine

Absorption tube A_3 is filled with 50 ml of 0.02 N sulfuric acid, using either a calibrated pipette or burette, the gas inlet is connected to V_2 and the gas outlet to WTM_2. The flow is started by opening V_2 and the flow rate is adjusted to a maximum of 6 cubic feet per hour. Care must be taken not to pass the gas at too high a flow rate in order to avoid liquid losses by entrainment. After passage of a maximum total of 18 cubic feet of gas the flow is stopped and the sulfuric acid is transferred to a 250 ml wide mouth Erlenmeyer flask. The tube A_3 is rinsed several times with small amounts of distilled water which are also added to the flask. The amine is subsequently determined by titrating the excess sulfuric acid with 0.02 N sodium hydroxide using methyl red as the indicator.

Determination of Diethylene Glycol

The diethylene glycol content of the gas is determined by calculation, using the equilibrium chart shown in Fig. 5.

Care should be taken that S.V. is opened sufficiently so that the system is under full line pressure up to V_1 and V_2.

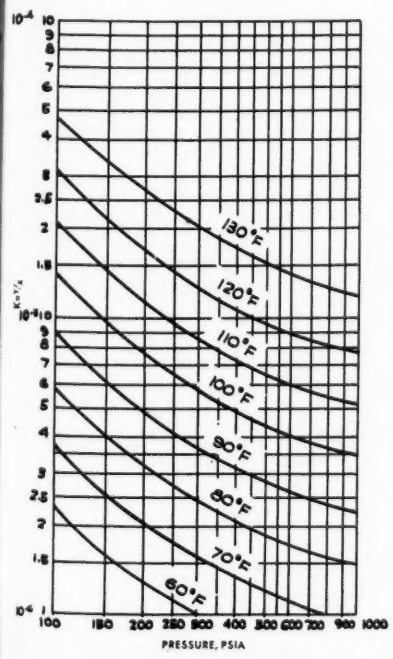
The absorption tubes A_1 and A_2 should be watched for change in color and accumulation of liquid. As soon as a yellow coloration or the appearance of droplets of liquid on the walls is noticed, the tubes should be emptied and loaded with fresh Anhydrone. Also if A_2 shows a weight increase larger than 5% of the weight increase of A_1, the latter tube should be reloaded.

This method is not designed for separate analyses of the individual vaporized liquids since only the monoethanolamine is determined directly. However, since the amount of glycol vapor present in the gas is of the order or magnitude of 5% or less of the total vaporized liquid, the use of an equilibrium chart for its determination is justified.

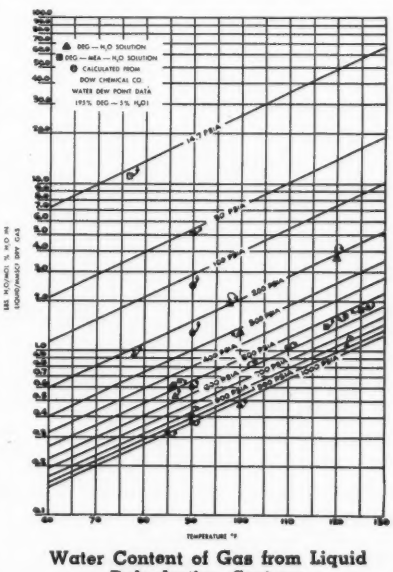
The procedure described above is designed for the analysis of gas at 500 to 1000 psig, which is the operating pressure range commonly encountered in glycol-amine treating plants. If the gas to be analyzed is at lower pressures, and therefore larger amounts of vaporized liquid are carried by the gas, the amount of gas used for an analysis should be decreased accordingly. However, the maximum figures of 6 cubic feet per hour and 18 cubic feet of total gas passed should not be surpassed at any set of conditions.

This method can also be used in dehydration plants employing diethylene glycol-water solutions. For such a system the analysis is simplified by omitting the second train for the absorption of the amine. The total vaporized liquid is determined by absorption on anhydrous magnesium perchlorate and the glycol vapor calculated from the equilibrium chart. The water content is found by subtraction of the glycol from the total vaporized liquid.

Fig. 6 presents data collected in this laboratory employing diethylene glycol-water and diethylene glycol-monoethanolamine water solutions in contact with hydrocarbon gas at different pressures and temperatures, following, in general, the method described above. The figure compares the experimental data obtained with a chart constructed partly from the data of Russel, Reid and Huntington[11], and partly from information published by the Car-



VAPOR-LIQUID EQUILIBRIUM CHART
DIETHYLENE GLYCOL
Figure 5



Water Content of Gas from Liquid Dehydration Systems
Figure 6

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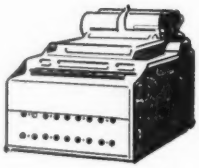

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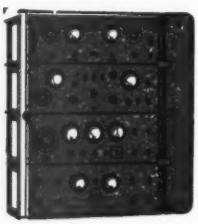

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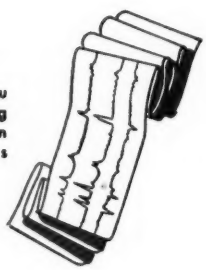

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CALCULATIONS

The gas volume read on the meter is corrected to standard conditions.*

$$\text{corrected volume SCF} = \text{observed volume CF} \times \frac{(460+60) \times P \times P - P_w}{(460+t) \quad 30 \quad P}$$

t=observed temperature, °F.
P=observed pressure, inches of mercury.
P_w=vapor pressure of water at observed temperature, inches of mercury.

1. Total vaporized liquid:

$$\text{grams of total vaporized liquid/SCF} = \frac{(W_2-W_1)+(W_4-W_3)}{SCF}$$

*Standard conditions: 60°F., 30.0 inches of mercury, dry.

W_1=weight in grams of A_1 before test.
W_2=weight in grams of A_1 after test.
W_3=weight in grams of A_2 before test.
W_4=weight in grams of A_2 after test.
SCF=corrected gas volume.

If the result is desired in lbs. of total vaporized liquid/MMSCF; lbs. of total vaporized liquid/MMSCF=$2.2 \times 10_3$ grams of total vaporized liquid/SCF.

2. Monoethanolamine vapor:

$$\text{grams of MEA vapor/SCF} = \frac{(V_1 \times N_1 - V_2 \times N_2)\ 0.0611}{SCF}$$

V_1=ml of H_2SO_4
N_1=normality of H_2SO_4
V_2=ml of N_aOH
N_2=normality of N_aOH.
lbs. of MEA vapor/MMSCF=$2.2 \times 10_3$ grams of MEA/SCF

3. Diethylene glycol vapor:

The diethylene glycol vapor in the gas is calculated from the attached equilibrium chart (Fig. 5).
For any given temperature and pressure:

$$K = \frac{Y}{X}$$

the solution of which may be obtained from the chart.
K=equilibrium constant, read from the chart for the operating conditions.
Y=mol fraction of diethylene glycol vapor in gas, the quantity which it is desired to evaluate.
X=mol fraction of diethylene glycol in liquid, which may be obtained from the following equation:

$$X = \frac{\frac{\text{weight \% DEG}}{106.1}}{\frac{\text{weight \% DEG}}{106.1} + \frac{\text{weight \% MEA}}{61.1} + \frac{\text{weight \% } H_2O}{18.0}}$$

Then:

$$Y = K \times \frac{\frac{\text{weight \% DEG}}{106.1}}{\frac{\text{weight \% DEG}}{106.1} + \frac{\text{weight \% MEA}}{61.1} + \frac{\text{weight \% } H_2O}{18.0}}$$

$$\text{grams of DEG vapor/SCF} = Y \times \frac{106.1}{0.8366} = Y \times 126.8$$

lbs. of DEG vapor/MMSCF=2.2×10^3 grams of DEG vapor/SCF

4. Water vapor:

grams of H_2O vapor/SCF=W_T/SCF−(W_A/SCF+W_G/SCF)
W_T=weight of total vaporized liquid
W_A=weight of MEA vapor
W_G=weight of DEG vapor
lbs. of H_2O vapor/MMSCF=2.2×10^3 grams or H_2O vapor/SCF

bide and Carbon Chemicals Corporation[2]. Table I shows dew points as actually indicated with the Bureau of Mines dew point indicator as compared with the dew point temperature corresponding to the experimentally found water content of the gas stream as calculated from the data of McKetta and Katz[8] (Fig. 7). The discrepancies between these two temperatures are quite obvious.

It can be seen from the foregoing discussion that the glycol and amine vapors are a definitely measurable proportion of the total vaporized liquid in the equilibrium gas stream. Since it is well known that the injection of any water soluble material, such as an alcohol, has a considerable depressing effect on the formation temperature of hydrates, it is obvious that the presence of glycol and amine vapors in the gas stream would have a similar action. Since in many instances, and particularly those involving natural gas transmission systems, the objective of gas dehydration is to prevent hydrate formation and subsequent stoppage of pipe lines, any means which depresses the hydrate formation temperature is desirable. Furthermore, in such cases where the gas stream contains organic liquids, the water content of the stream is no criterion of the temperature at which hydrates are formed and therefore determination of so-called "dew points" and water content cannot be correlated directly with the hydrate forming temperature.

It is interesting to note that a major pipeline operator, employing a liquid dehydration system, has operated continuously throughout the coldest winter conditions encountered for many years without a single freeze of a line. This in spite of the fact that the temperatures in the line were considerably below the calculated water dew point of the gas entering the line and therefore hydrate formation was to be expected.

Since the liquid which condenses from the gas has an increasing amount of water carried with it as it condenses (Fig. 3), the equivalent water dew point of the gas is always below the actual temperature of the gas as long as the condensate is allowed to stay in contact with the gas. If the gas mentioned previously in connection with Fig. 3 from

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Table 1

Comparison between water dew points found by Bureau of Mines dew point indicator and by determination of absolute water content of gas in equilibrium with diethylene glycol—monoethanolamine—water.

Gas Pressure Psia	Gas Temperature °F	LIQUID COMPOSITION WT% DEG	WT% MEA	WT% H_2O	Lbs. of H_2O Per MMSCF	*Equivalent Dew Point °F	Determined Dew Point °F
300	100	97.9	——	2.1	14.9	30	46, 47
600	103	75.4	19.2	5.4	20.0	52	58
600	110	77.6	17.0	5.4	23.9	59	53, 55
1000	85	97.2	——	2.8	4.8	24	26, 39
1000	100	97.0	——	3.0	7.2	35	28, 34

*Calculated frm "WATER CONTENT OF NATURAL GAS," (Fig. 7).

the glycol-amine plant were cooled to 60°F., the dew point calculated from the original water content (original equivalent water dew point 38°F.) would be lowered to 36°F. If it is cooled to 50°F. the equivalent water dew point is lowered 340°F. and if it is cooled to 40°F. the residual water is sufficient to yield an equivalent water dew point of only 28°F. Therefore it becomes a question of the hydrate forming temperature of the condensate only which at 40°F. has 67% water, the balance being glycol and amine. It appears to the authors that the dehydration of gas by liquid absorbing agents should be evaluated rather by the actual water content of the gas thus treated than by the dew point depression which is commonly used at present. Although slightly more complicated and time consuming analytical procedure is probably not justified for routine control, it is felt that it is indispensable in cases where a performance guarantee of equipment is involved.

It should be remembered finally that, although we have referred occassionally to phenomena occurring after the gas leaves the plant, this discussion is concerned primarily with analytical tools and methods and not at the theoretical or actual composition of condensates in pipelines or even the presence or absences of them. Changes of pressure must also be considered along with changes of the temperature since the vapor carrying capacity of a given gas varies rapidly with varying pressure and therefore this discussion has been confined to treating and dehydration systems in which the pressure is assumed to be constant.

Conclusions

(1) Theoretical and experimental considerations indicate that the determination of the water content of gases evolving from liquid dehydrating systems cannot be determined by the use of the conventional dew point determination equipment.

(2) Experimental and calculated figures show that gases evolving from dehydrating plants using liquid dehydrating agents carry condensable vapors other than water which constitute a considerable portion of the total condensable liquid content of the gas stream.

(3) An analytical method for determination of the actual water content of gases effluent from liquid dehydration systems is presented.

(4) In the light of the preceding conclusions, it may be presumed that the hydrate formation temperature of such gas streams would be considerably lower than that which would be indicated solely by the water content of the gas stream.

(5) Rating of the efficiency of dehydration equipment has the sole purpose of allowing control of the water content of the effluent gas stream at a low enough value that the water content of the condensate will not allow hydrate formation at the temperatures expected in the pipe line. Therefore the authors believe that the rating of such equipment should be based upon the actual water content and not on the dew point of the gas.

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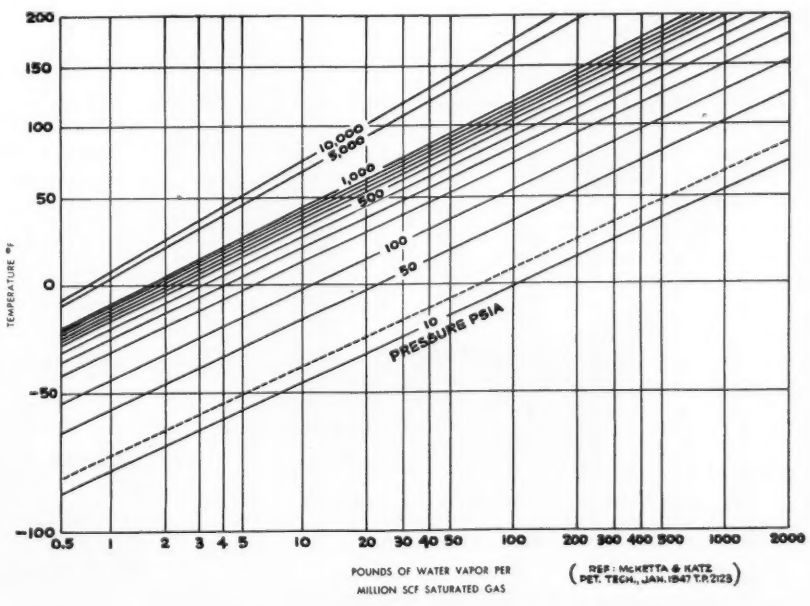

Figure 7

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Problems and Methods Of Contract Drilling

ABSTRACT:

It is questionable that a perfect drilling contract will be developed. Mr. Winter's paper considers the problems of contract drilling and outlines several types of contracts in use in California.

The paper also discusses the form of the contract, the types of rates generally considered, and the many contingency problems that require additional clarification.

Proper attention to these items will make it easier to apply common sense and fairness to the benefit of both the contractor and the company.

By Henry E. Winter
Union Oil Company of California

I. INTRODUCTORY

The increasing trend in California toward rotary drilling by Contractors has brought to light a number of things which could be more clearly covered in a contract in order to save later misunderstandings. The following ideas are intended to refer only to California methods and practices.

About ten years ago an A.P.I. committee tried to formulate a uniform drilling contract for California but such a contract never was developed, although many ideas were brought out which are in use at the present time.

I doubt if the perfect drilling contract will be developed, as the oil business itself keeps changing or progressing, and methods of contracting have to change with it.

In the last analysis a contract is simply a written agreement of a meeting of the minds wherein one party agrees to perform certain work or operations for a consideration to be paid by the other party.

The word "Contractor" will be used hereafter to refer to the drilling contractor and "Company" will be used to mean the oil company or operator hiring the contractor.

II. TYPES OF CONTRACTS

There are several types of contracts in use at present, each of which has advantages and disadvantages. These are as follows:

(a) "Footage" or "Bottom Hole."

The advantage of the footage type of contract is simplicity as far as the Company is concerned. The Contractor's price usually includes moving in and out with derrick, hoist, pumps, drill pipe, racks, etc., and he can drill the hole with his own preference as to type of bits and wear on machinery.

This type of contract is used to best advantage when the subsurface formations are known and the Contractor can obtain good data on time and bits from nearby wells from which to estimate costs.

(b) "Day Work"

This type of contract is more or less necessary for wildcat or exploratory wells and for redrill or workover jobs.

While a contractor can give a footage bid for this type of work, the number of unknowns which he faces is bound to make him add plenty of insurance, in which case the Company will pay too great a price for the work if the insurance should not be needed.

(c) "Modified Day Work":

This is a form of contract in which the Contractor bids a cost per day plus so much a foot for each foot of hole drilled.

It has some advantages, especially in proven fields, in that if the Contractor should have some hard luck, he is not liable to lose much money on the job and is more or less sure of some profit if he stays there long enough to make the hole.

The disadvantages are that about the time the formations soften up and the Contractor can make some footage to add to his daily rate, the engineer or geologist on the job decides to core or make formation tests.

By the time an area is developed to the point that the proper rate per foot can be established, there is usually enough information to get reasonable competitive footage bids.

(d) "Cost Plus Percentage Profit":

This type of contract is usually in use only when one contractor is doing all the work for some company and it involves a well-established cost accounting method on the part of the Contractor plus periodic checking of costs and readjustment in order to insure a fair cost to the Company and a fair profit to the Contractor. From a practical standpoint this method is easy for a company to operate under but it usually involves an obligation to keep the Contractor busy and a contractor can get lax and out of date without competition.

(e) "Day Work Incentive";

Some attempts have been made with a form of contract in which the Contractor works at his regular day rate for so many days and beyond this number of days at a lesser cost rate. If the Contractor finishes the work in less than the specified number of days, he gets as a bonus one-half or some other percentage of the saving which he makes the Company. This idea involves the agreeing upon a number of days and the Company furnishing bits and mud. By making a flat rate for moving in and out and rigging up and dismantling, this method of contracting could insure the Contractor against loss and he would tend to keep the drilling cost low. A flat sum for taking the risk of fishing to some specified depth would eliminate the Company's risk of having the Contractor show up with a poor string of drill pipe. While every contractor admits that he has only the best in drill pipe, the Company representatives oftentimes have occasion to question this.

III. REQUEST FOR BIDS

If a company is choosing its contractors by competitive bid, one of the most important things is a clear,

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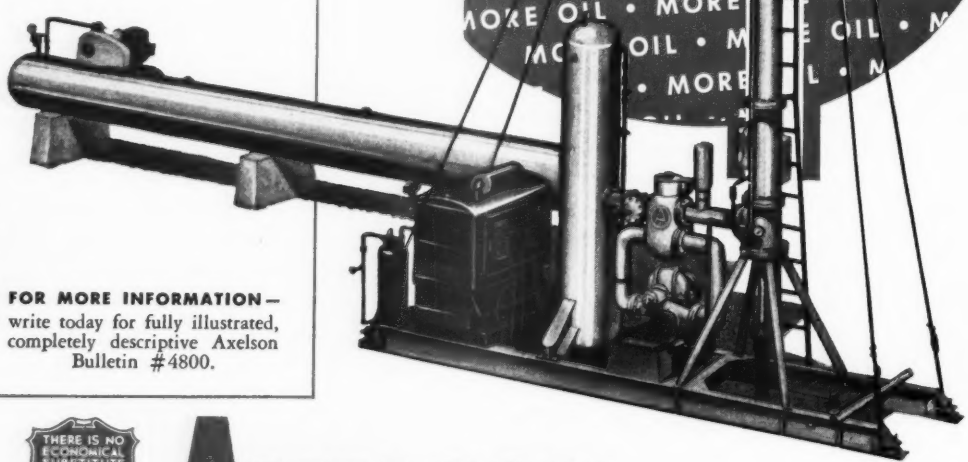

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concise letter requesting bids. This permits the Contractor to make fair competitive bids, which can easily be compared by the Company.

The request should contain the location of the well and a fairly detailed description of the work, especially size and amount of casing, hole sizes, coring expected, type of mud to be used and how much Company will furnish, how much standing-cemented time and loss of circulation time Contractor is expected to furnish. Under some circumstances it may be desirable to request the Contractor to bid with a specified size, or larger, equipment. Conditions may make it desirable to use a standard steel derrick instead of a mast and two or more pumps. These are the items which largely affect the Contractor's footage price.

Other items which could be included are the names of Company representatives who should be contacted in order to obtain site and cellar specifications, together with bit and subsurface data from surrounding wells.

The request for bid should tabulate who is to furnish the major items such as blow-out equipment, fuel, water, mud and water storage, bits and core heads, cementing or logging services or other items which are not usually a part of the Contractor's equipment.

The bid request should clearly state the time limits when bids should be in and the interval or time limit within which Contractor should be starting to drill. The greater interval that can be given for a contractor to move in will oftentimes lower the cost per foot considerably as a contractor has a problem in keeping his rigs busy without delays between jobs and a short move by some contractor in the area will cost him and ultimately the Company less per foot than a long move by any Contractor. When it is necessary for the company to make a hurry-up deal to meet some deadline, this always costs the Company considerably more as it limits the number of contractors available to furnish competitive bids.

Bid requests should ask for the various rates in the same form as they will be in the contract; namely, footage rate, coring rates, hourly rate with drill pipe, hourly rate without drill pipe, delay time, shut-down time, rates for use of different type of circulating fluids, and any

other rates that may be desired. If these are all answered by the Contractor, it should not take the Company long to make a comparison and decide on the Contractor.

As a matter of good business practice, the losing bidders should be notified as soon as possible in order that they can be looking for another job.

In making a request for bid, it will pay the Company to take as much risk as possible off the Contractor especially as to unforeseen or unusual items. Whenever the Contractor takes risk, he has to put in insurance for it and most of these risks can be better taken by the Company. The items of number of days to drill the hole and number of bits to be used in a footage type contract are, of course, matters of judgment and the Contractor's confidence in his ability. Items such as amount of mud to be used and loss of circulation had, in general, better be taken by the Company. They present a problem on only a few jobs and its saves paying for them on every job, even if some Contractor will take the risk. The Contractor that takes these risks continually without plenty of cushion in his price or a limit on his risk is liable not to be contracting very long.

IV. FORM OF CONTRACT

Contracts usually take one of three forms; namely, simple letters of agreement without much detail, legal documents with detailed check lists attached or the legal document with an Exhibit attached which gives the procedure, various rates of compensation and the general items to be furnished by Contractor and Company.

The simple letter of agreement is good only when the same parties are working with each other and have arrived at a lot of general verbal understandings. Auditing and purchasing departments are not much interested in this form of contract.

The contract with the detailed check list is a good answer when all the wells are drilled in one area, but it is hard to make a check list that takes care of all contingencies in all areas. By the time the list is complete enough to take care of all contingencies that keep showing up in the oil business, the list is so long and detailed that one cannot find what he wants in it.

This check list requires a lot of work and more details than the engineer is liable to furnish in order to do it right. It does not give the Company representative much room to use good judgment and fair dealing in taking care of the unexpected.

The legal document with an Exhibit attached which gives the procedure, compensation for various contingencies and general items to be furnished seems to work fairly well. It should cover the major items to be furnished by each party, and the matter of determining which rate is to be used can always be answered by asking the question—"For whose benefit is this particular part of the job?" Either the Contractor has to do it as part of his contract or the Company wants it done as an extra. Common sense and fairness with a little give and take will always solve these minor differences. The time and work that would be spent in trying to get every contract "fool proof" had better be spent in developing better supervising personnel.

Whichever type of contract is used, it is desirable that it be more or less uniform, at least as regards the form and main items. Local conditions will necessarily cause minor changes but this should be apparent in the contract. These minor changes are possible with the type of contract which keeps the legal phases separate from the Exhibit.

When one looks at oil well con-

tracting as a whole, a contract is more of a memorandum than a good chance for a lawsuit. While the Company and Contractor's lawyers demand a lot of legal language to protect both parties, few companies expect and non eintends to bother with Contractors that are likely to involve them in legal difficulties.

The general desire is to arrive at honest, ethical agreements which do not run counter to custom of the trade. Sometimes it is desirable to run counter to custom, but if so, it should be part of a long range viewpoint where it is believed the custom will change and this item should be pointed out to bidders and the selected Contractor.

V. TYPES OF RATES.

It is desirable that a contract should have rates for all the possible contingencies that might occur in drilling the well. The following types of rates, while not complete, seem to cover the matter:

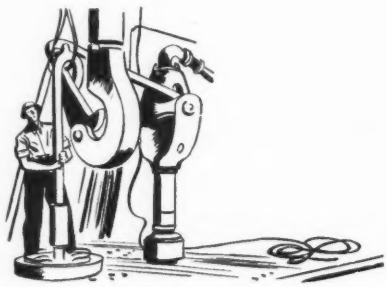
Footage Contract

1. (a) Rate per foot, including derrick, moving in and out, rigging up and dismantling, running casing and liner.
   (b) Rate per foot, or daily rate, for coring. Whether coring should be on footage or day rate depends upon the amount of coring and how definite the coring program is.
   (c) Daily rate for unanticipated directional drilling or exploratory drilling below estimated depth.
2. Hourly rate for miscellaneous work using drill pipe.
3. Hourly rate for miscellaneous working using machinery and crew but **NOT** drill pipe.
4. Hourly rate for delay time with full crew available.
5. Hourly rate for shutdown time (equipment and watchman).
6. Daily rate for use of oil base drilling fluids.
7. Daily rate for use of oil emulsion drilling fluids.
8. Daily rate for use of starch base drilling fluids.

Day Work

1. Flat rate to move derrick and machinery in and out, rig up and dismantle. This can be broken down to cover the various items such as derrick (or mast), erection, rental of derrick, moving in and out, rigging up and dismantling.
2. Daily rate for drilling, coring and work with drill pipe.
3. Daily rate for work using machinery and crew but **NOT** drill pipe.

(4 to 8) Same as under Footage Contract.



VI. EQUIPMENT, MATERIALS, AND SERVICES.

The question of "who furnishes what" will vary considerably both with the type of contract and general custom in the local area.

The Company usually furnishes roads, site, water, casing, tubing, casing landing equipment, cementing and logging services, formation and water shut-off testers. The general viewpoint is for the Company to pay for those things which are not a part of the Contractor's equipment.

The Contractor usually furnishes all the necessary tools and equipment to do the work, such as the derrick (or masts), hoists, circulating pumps, drill pipe and drill collars, casing and sand lines, casing racks and lighting equipment.

Some of the items which could be furnished by either and, as such, should be specifically mentioned, are cellar, conductor pipe and risers, sumps, fuel and mud storage, blowout equipment, bits, core heads, hole openers, reamers, mud and mud storage, extra water storage, casing and tubing tools.

Depending upon local custom or verbal agreements, to adjust a bill is more trouble and less satisfactory than simply to enumerate the major items in a contract.

VII. PROBLEMS NEEDING CLARIFICATION.

There are several items which come up periodically and are often omitted from contracts or upon which there is a wide diversity of opinion or custom of settlement. Some of these items are oftentimes not anticipated at the time the contract is made; but even when they are foreseen, a good method of evaluating them does not yet seem to have been developed.

(a) Loss of Tools

In a footage contract this is a risk that the Contractor is presumed to take as the tools are his as well as the responsibility while fishing for the tools. However, there is often a difference of opinion when the tools are lost due to loss of circulation which was not anticipated. The question then arises as to whether the tools were lost due to the Contractor carrying the mud too heavy and thereby causing the loss of circulation, or due to Contractor's operational procedure or negligence after the loss of circulation started.

In the day work type of contract, this problem does not usually arise as the customary viewpoint is that the Contractor is doing what the Company requests and the Company is assuming the loss of tools and reserving the right to decide upon the fishing procedure.

If the tools are lost and the Company is liable, it should be clearly stated whether the value is undepreciated value or some portion of replacement value. It seems very difficult to decide on a percentage figure as the Contractor usually maintains he will be changing drill pipe and drill collars just before the job. Anyway, the drill pipe and drill collars that get lost always seem to be the new ones.

(b) Breakdowns of Contractor's Equipment

In footage type contracts, this is a factor only while the Contractor is doing day work and is usually more or less negligible, although the average contractor should have about an hour a day in his price for it.

In day work contracts it is a factor for the whole job and the Company should set some limit per breakdown or per month. The reputable contractor doesn't expect to repair all his machinery on the job, but the unexpected always happens and a time limit on this item is a

good method of making the Contractor guarantee that his machinery is in good working condition. The limit should be reasonable as a contractor is going to have these minor breakdowns and too much intolerence along this line tends to force dishonesty on the part of the Contractor's crew when keeping a log book of their time.

(c) Loss of Circulation

Some areas do not have to contend with this problem, but where loss of circulation is liable to be encountered, the amount of time which the Contractor should furnish should be clearly stated. Some of the other problems that go with loss of circulation are the possibility of losing drill pipe due to loss of circulation and the question of which party is in charge of the mud control in trying to regain circulation. Other problems which often arise are whether the Contractor was negligent in keeping his mud weight too high and thus contributed to loss of circulation; or was his operational procedure, as soon as the loss was noticed, the proper one? Should he have stayed in the hole and tried to regain circulation or should he have pulled out of the hole at once?

(d) Excessive Wear of Drill Pipe

In areas where the formations are known, this item is usually considered in the Contractor's bid price, but on wildcat or directional wells on day work, contractors either have to put in an estimate for this contingency or the contract should make some provision for reimbursing for wear above normal if it should occur. One method is for the Company to agree to pay one-half the cost of building up tool joints or drill collars for such abnormal wear on the theory that, if the Contractor believes it necessary to spend his own money on such repairs, the Company will match this amount. This would presume that the Contractor will show up on the job with a good string of drill pipe and not one which needs repairing soon after it shows up on the job.

Some of the above reasoning can also be used on Day Work wells for straightening drill pipe bent due to fishing, directional hole, or formation testing.

In the Rocky Mountain area a custom in use of bidding a separate price for drill pipe which depends upon depths at 1,000 ft. intervals and days in use. This method might have some possibilities in California, especially along the line of unanticipated excessive wear.

(e) Insurance

Insurance of some kind is required by the Company in all contracts. The three types commonly required are: Workmen's Compensation, Public Liability, and Property Damage. The Contractor complains that insurance costs a lot of money and the Company oftentimes wonders what it gets for it. In practically all wells drilled, there are times when the Contractor is working under Day Work and the Contractor's viewpoint is that part of his liability ceases when working under the orders of the Company.

While the Company under the various "hold harmless" clauses in all contracts tries to saddle the liability on the Contractor, it probably develops in practice that they are both paying for insurance for the same thing as the Company cannot fully rid itself of primary liability except where negligence of Contractor is proven. Trying to prove negligence on the part of the Contractor is usually very difficult. Probably the only reason that many contractors are still in business or that companies can get wells drilled is because of a certain amount of forbearance on the part of companies enforcing the "hold harmless" clause.

Since the Texas Supreme Court, in the case of Elliff vs. Texon Drilling Company, decided that a contractor was liable for subsurface damage, the insurance companies want more money or some exclusions in the policies or "hold harmless" clauses. The American Association of Oil Well Drilling Contractors and the A.P.I are both working on the problem at present and it is to be hoped that some of the questions on liability will be cleared up.

(f) Bonds and Credit Rating

Some companies require bonds by the Contractor for faithful performance but in the last analysis, the Company has to pay for the bond. This is an extra cost to the Company that is probably not necessary except in unusual circumstances. In general, part of the same results can be obtained by watching the Contractor's credit rating and filing a notice of completion.

(g) Special Tools and Services

Customarily the Company furnishes many of the special tools or services required in drilling a well, such as cementing, logging, formation, water shut-off testing, and blow-out equipment. These items should all be mentioned in the contract in order to avoid any misunderstanding as to who is to furnish them. In some sections of the United States, blow-out equipment is part of the Contractor's tools and he should furnish it as part of his equipment. The general California viewpoint seems to be that the Company has better control of this item if it furnishes it, especially in view of the fact that few contractors have blow-out equipment and the Contractor would simply go rent it and put it in the Contractor's price.

(h) Miscellaneous Items

There are a number of other items which are more properly part of the Contractor's service; for example, safety practices, neatness of rig area, excessive use of water, to mention only a few of them. In the final analysis a contractor furnishes a service and these things are a part of that service, as well as his derrick, hoist, pump and drill pipe.

CONCLUSIONS

There has not been any attempt to cover all the details and customs of some particular area but merely to outline some viewpoints and problems common to all areas in California. The solution to many of the problems presented above may have been worked out verbally in local areas, but getting them clearly in a written contract would be to the mutual advantage of both companies and contractors. While it is doubtful if the perfect "fool proof" contract will ever be made, proper consideration for the above items will make it easier to apply common sense and fairness in both operating under the contract and in the final payment by the Company.

This paper presented at the Spring Meeting of the Pacific Coast District, Division of Production, A.P.I., on May 12, 1949.

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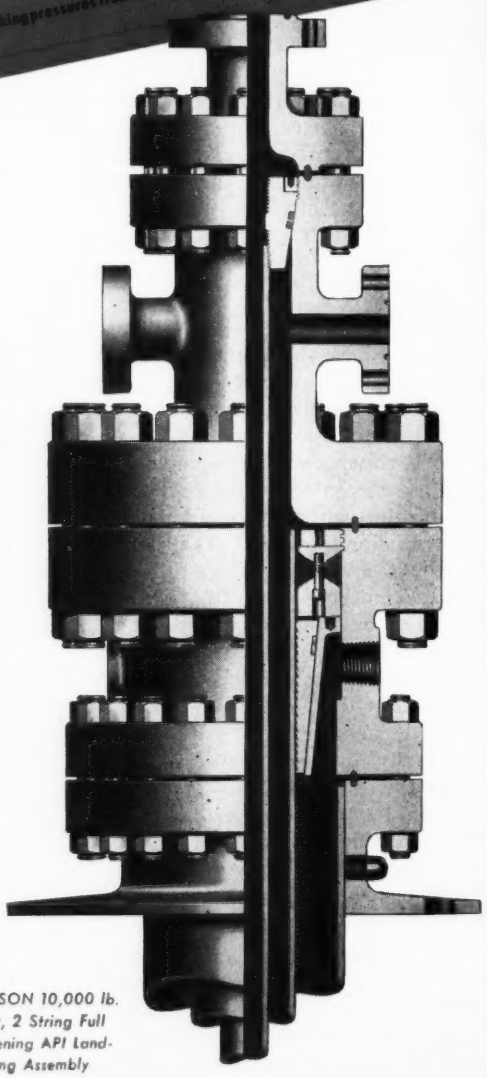

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Rocky Mountain NEWS

Colorado—Idaho—Montana—New Mexico—Utah—Wyoming—Western Canada

Rocky Mountain General

Carter Oil Co. has followed Ohio Oil Co., and Stanolind in posting lower prices for heavy black Wyoming crudes with high sulphur content. The Carter posting, which meets the lower price schedule of the other two buyers, affects Elk Basin heavy crude oil and Frannie crude oil in Wyoming and Montana.

The price for 40 gravity and above remains unchanged at $2.47 per barrel, with the hitherto prevailing two cents a barrel downward differential for each degree of gravity to and including 36 gravity. Below that, a revised sliding scale of differentials is established.

The net effect of the revisions below 36 gravity is an average price reduction of approximately 13 cents per barrel at Elk Basin and about 22 cents per barrel at Frannie.

At the same time the company discontinued its posting for Byron, Garland and Oregon Basin crudes in Wyoming's Big Horn Basin.

Black oil prices tumbled for the first time in Wyoming fields May 11 when Ohio Oil Co. reduced the posted price for Oregon Basin, Byron, Garland and Hidden Dome fields in the Big Horn Basin to a flat $1.65 per barrel. The cut was approximately 35 cents a barrel.

Harold H. Healy of Casper, division manager for Ohio Oil Co., said the decreased demand for heavy fuel oil and the reductions in fuel oil prices made this action necessary to place these heavy black oils in a more realistic position in relation to the market for heavy fuel oil, the principal end product.

The reduction is expected to stabilize the black oil price in the Big Horn Basin, where some sales of black crude at prices below the posted schedule had been reported. Ohio buys about 14,000 barrels of oil daily from the four fields, at the present time. It is hoped the price cut will result in an increased demand for oil from these fields.

It was anticipated other operators, such as Stanolind Oil and Gas Co., Carter Oil Co., and other black oil purchasers would join Ohio in the price cut, which follows similar reductions in black oil fields of Texas, Louisiana and California. No reduction in posted prices is foreseen for high gravity asphalt base oils from fields like Silver Tip, Worland and Nieber Dome.

A slight increase in the number of active drilling rigs in the Rocky Mountain region has been reported in the last few weeks. The total number of rigs in the region is placed at about 225, a decrease of 10 from the total reported earlier in the year. These 10 rigs have moved into western Canada.

The total number of rigs now reported in the region is divided almost equally between those actively drilling, and those idle or stacked. The idle or stacked rigs include some company rigs that have not been in operation since last fall, as well as a number of others that are becoming obsolescent and cannot compete with present day drilling equipment.

Exploratory drilling is expected to continue increasing during the summer months, resulting in a higher percentage of operating rigs.

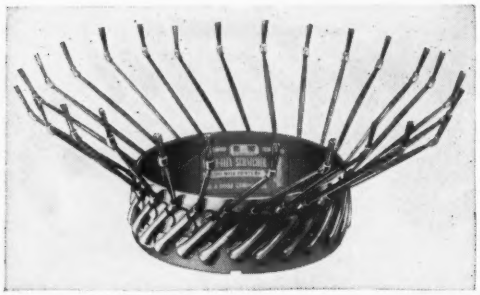
One of the largest drilling contractors in the Rocky Mountain region, Loffland Brothers, has well over half of its score of rigs operating at the present time. Another large contractor, Kerr-McGee Oil Industries, Inc., had only one-fifth of its rigs running early in May, but expected to be running more tools later on.

The rapid increase in leasing and exploration activity in Montana and North and South Dakota has led to the formation of a second oil scout check in the Rocky Mountain region. The new check, known as the Northern Rocky Mountain Scout Check, held its initial meeting at Lewistown, Mont., on May 4.

Officers are Robert Willis, The Texas Co., president; Joe Seymour, Phillips Petroleum Co., vice president, and Leonard Scott, Shell Oil Co., secretary-treasurer. Eight companies are represented in the new check, and meetings are held each Thursday.

Interest in Devonian reef possibilities extending southward from Canada into northern Montana and the Dakotas has led to an unprecedented lease play and exploration work in the northern parts of the border states. This has widened the area for scout work in the Rockies, leading to the formation of the second check. The other and older oil scout check is held each Thursdday in Casper, Wyo.

Meanwhile the Devonian drilling play is starting in northwestern Montana, where locations for six tests have been announced. General Petroleum Corp. has made a location for a Devonian test in the Agawam area in Teton county (9-26n-4w). The British-American staked a location in the Dutton block, Teton county, just 15 miles southeast of the GP test. Independent operators have made locations for other Devonian tests in Choteau county. Hunley and Nairns are rigging up for a test in section 27-26n-3e, about 30 miles north of the city of Great Falls.



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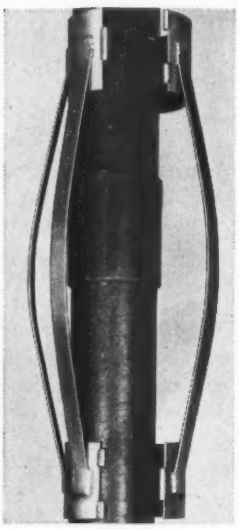

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Samuel B. Pettengill, member of Pure Oil Co.'s legal department at Chicago and a nationally known newspaper columnist and radio commentator, was the keynote speaker at the Rocky mountain district spring meeting of the American Petroleum Institute held in Casper May 26-27. Mr. Pettengill is the author of the book, "Hot Oil," published in 1936, which summarized arguments on the issue of control or nationalization of the petroleum industry. He favored state, rather than federal regulation, and the highest degree of industrial freedom consistent with the conservation of natural petroleum resources. In 1940, he wrote "Smoke Screen" to show that increasing federal controls over every facet of American business had its counterpart in development in Germany and Italy. It was the best-selling non-fiction book of that year.

Personal

Lawrence Lee, vice president and manager of refining and sales for Husky Refining Co., at Cody, has announced that S. J. (Stan) Gardner has joined Husky as traffic manager. He was traffic manager for Western Oil and Fuel Co., at Minneapolis, from 1927 to 1947, and most of his work has been in connection with state commissions, interstate commerce and transportation matters.

Phillip Wagner has resigned as Wyoming district geologist for The Superior Oil Co., and has taken a post as representative for C. H. Murphy and Co., at El Dorado, Ark. He will maintain offices for the company in Denver as representative for the firm in the Rocky mountain region.

Appointment of five foremen for Carter Oil Co.'s new Billings refinery was announced by T. R. Corbett, manager of manufacturing. They are Paul Dana, instrument foreman; James P. Egan, Electrical foreman; Matthew D. Schafnitz, pipe foreman; A. B. Ott, service foreman, and Frank Mugford, chief metal inspector. The latter formerly worked for Colonial Beacon Oil Co.'s refineries in Everett, Mass. and the Dutch East Indies.

Colorado

A new retort developed by Union Oil Co. of California will be installed at the Rifle area in Garfield county, Colo., for use with the Bureau of Mines experimental shale oil plant in that area. The announcement was made by Interior Secretary Krug, who said the retort is more advanced than the one now in use by the government. It is said to be capable of producing about 50 barrels of oil per day.

Colorado reports about 12 actively drilling wells at this time, as compared with 66 at this time a year ago. Most of the interest has centered on the southwest corner of the state where Byrd-Frost, Western Natural Gas et al drilled the discovery gas and condensate well in the Dove Creek structure, Montezuma county.

Seven miles northeast of the discovery well, the H. E. R. Drilling Co.'s No. 1-A Lane Coffee is reported drilling below 5,500 feet, with no reports of shows divulged as yet. Two miles southeast of the discovery, the H. E. R. No. 1 Pedigo is preparing to drill ahead after cementing surface casing at 345 feet.

Elsewhere in Colorado, British-American Oil Producing Co., has picked a site for its Tertiary test of the Dry Mountain structure. The well, No. 1 Raeder-Government, will be drilled about 4,000 feet in section 29-9n-99w. Arrow Drilling Co. has the contract.

Olds Oil Co., has abandoned the Berthoud test in Larimer county at 4011 total depth, after finding some saturation in the top of the Dakota sand at 3777 feet. The zone was too hard and tight to produce.

Champlin Refining Co., has abandoned the Brush Creek wildcat in Eagle county (4-5s-84w) at total depth of 6321 feet, with no shows reported.

The Oklahoma Oil Co., of Denver has acquired an option on more than 5,000 acres on the Dove Creek structure, it was announced by James R. Macon, general manager of the firm. He said the block centers around sections 31 and 32 in 38n-17w, with the consideration reported as $10 an acre. A deep test well will be started before Jan. 30, 1950, with a 2 per cent over-riding royalty specified for owners of the land.

Macon added that if the Lane-Coffey well now being drilled in section 34-39n-18w is completed as a commercial producer before payment of the $10 an acre by Oklahoma Oil, the cash consideration will be raised to $15 an acre. He said a portion of the new block will be farmed out to another operator for a well to be drilled to the Paradox sand this summer.

Oklahoma Oil's block is about eight miles southeast of the discovery well, Anna Driscoll, and Byrd-Frost's second well, the White No. 1, which was recently abandoned. Ohio Oil Co. and Gulf have leases within and adjoining the new Oklahoma Oil holdings.

Oklahoma Oil was one of the early independents to enter the Dove Creek play after the discovery well came in. It purchased a 640-acre lease for $100 an acre and a 280-acre lease for $50 an acre last December, and plans a test of the block soon.

Most of the companies operating in the Rocky mountain region are leasing land in Dove Creek and the nearby McElmo dome area.

Wyoming

Mid-May found The Superior Oil Co. running three and three-quarter miles of seven-inch casing at the world's deepest well at Pacific Creek, Sublette county, Wyoming. The well, No. 1 unit in a 51,000-acre block on the northeast side of Wyoming's Green River Basin, had reached a total depth of 19,765 feet.

Prior to running the casing—a record feat for the drilling industry in itself — the operator had done considerable coring below 19,000 feet, probably taking samples from one of the Upper Cretaceous sands. Despite its great depth, the venture

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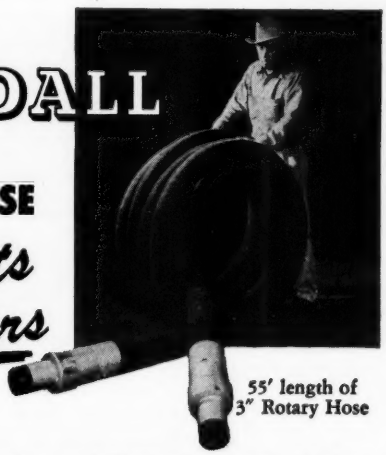

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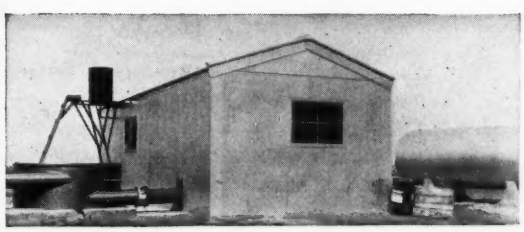

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had to drill through a heavy mantle of Tertiary deposits before reaching the uppermost potential oil producing sands of Upper Cretaceous.

Top of the Mesa Verde had been listed at 8,434 feet, but this figure is undoubtedly due for revision. No other formation tops lower than Mesa Verde have been called for the well, and no information given out by the operator on the geology of the structure.

Approximately 400 days of rig time have been consumed in drilling the record well to 19,765 feet, and estimates of the cost of deepening the venture from the old total depth of 9,881 feet have ranged from $500,000 to $1,000,000. The cost of the National 160 rig itself is placed at around $1,200,000. This is the third successive world's record depth well drilled by The Superior Oil Co., and it may be the first one to be tested for oil and gas shows, as evidenced by the running of casing at this time. There have been persistent rumors of oil and gas shows in the wildcat. High pressures and a gas flow were encountered around 12,200 feet, possibly in the Mesa Verde, but the most likely prospect for oil shows probably will be found between 19,000 feet and total depth.

Several important wildcat locations have been staked in Wyoming as the summer drilling program moves into high gear.

General Petroleum has picked a site for its first well in the new Gray Rocks unit, in Platte county. The test, in section 2-24n-66w, will seek the Sundance formation around 2,500 feet, in an area where there has been little drilling in the past.

Pacific Western has staked a location for a 4,000-foot Tensleep test at section 15-5n-1w in the Little Dome structure, Fremont county. The acreage was recently acquired on a farm-out from The Superior Oil Co.

In the same area, Merle E. Morton has made location for a second well on the North Sage Creek structure on a farm-out from Stanolind Oil and Gas Co.

Phillips Petroleum and Kerr-McGee Oil Industries, Inc., are picking a location for a second well on the Baggs structure near the Colorado-Wyoming line in Carbon county. The test, in section 15-12n-92w, is one-half mile southwest of a deep test drilled by the operators two years ago, which logged a small amount of gas in Tertiary sands.

Tide Water Associated Oil Co. has staked a location for a 10,000-foot test in the Poison Springs unit, located about 10 miles southeast of Pure Oil Co.'s West Poison Spider field west of Casper. The venture will be drilled in section 31-32n-83w, and is of interest due to its proximity to West Poison Spider, until recently the world's deepest producing oil field.

Amerada Petroleum Corp., has picked a site for a 12,500-foot Frontier sand test in the Reno Hill area of Johnson county. The venture, in section 18-45n-80w, is located northwest of the deep Smith Cut wildcat now being drilled below 9,700 feet by the same operator, and also headed for an objective at 12,500 feet. Both of these deep tests will have an important bearing on deep basin drilling on the west side of Powder River basin.

Developments at the new Taylor-Sussex field in southern Johnson county, about 18 miles north of the old Salt Creek field, have spurred interest in this area of the Powder River Basin. Continental Oil Co. recently discovered two more pay sands while drilling the second offset in the field, then made a new discovery in a semi-wildcat well drilled three miles southeast of the discovery. The latter well tested 4,800 feet of high gravity, green oil in a drill stem test in the Lakota sand.

Hope has not been abandoned for Amerada's wildcat at Sage Spring Creek, south of the Salt Creek field in Natrona county and a little southeast of famed Teapot Dome. Slowly perforating and testing at two-foot intervals in the Dakota sand, the operator last week recovered 100 feet of oil and some oil

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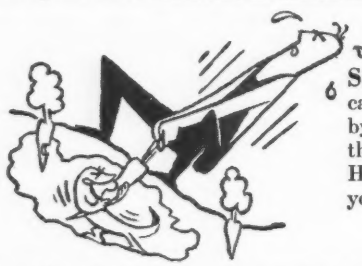
(Here are a few interesting things about oil and oil people to help you "talk up" the oil business to friends and customers. The better people understand your industry the better they'll think of you.)

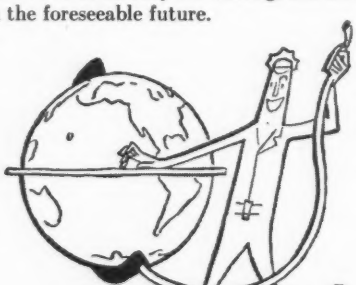
If the circus trapeze artists look happier these days, oil people can take a bow. Rope burn, long an occupational ailment of aerial performers, is now largely a thing of the past—thanks to a tubular sleeve of wicking that protects the performers from the burning, abrasive action of manilla ropes. Wicking is the material used in central draft lamps, oil stoves and portable oil heaters—one more of the thousand and one products produced by Petroleum.

Credit the oil industry with the first real advance in surveying methods since the Pyramids. For 5000 years, the shape of the earth's surface has been measured with rod and level—by men working their way on foot through snow and blistering heat. Comes now the answer to a surveyor's dream—an auto-drawn elevation measuring device which permits travel in comfort, helps cover up to sixty miles a day compared to eight miles averaged with traditional methods. Chalk up one more exhibit in the record of Petroleum's Progress.



Scientists predict that two million acres of land now lying idle in the Southwest can now be brought back into production—with the help of new soil fumigants developed by oil. Slated for rough treatment at an early date are the nematodes—which attack thousands of plant species, including tomatoes, cabbage, corn, tobacco and citrus. Here is another example of how oil research helps farmers produce more of your urgently needed food.

Oil exploration is now taking to the air with an amazing airborne magnetic device. So sensitive that it measures one part in 50,000 of the earth's magnetic intensity, this new device speeds up exploration a thousand fold. Immense stretches of ocean, impenetrable mountains and bleak arctic tundra, where great new reservoirs of oil may lie waiting, can now be expected to give up their secrets in the foreseeable future.



Next time somebody mutters a warning about the end of oil supplies being imminent, here are some facts you can offer: Since 1859, when oilmen first began to punch and drill holes into the earth, they have found some 128 billion barrels of crude oil, of which 58 billions have been produced. They're finding more all the time, faster than we're using it up right now. And scientists estimate that if present supplies should ever be depleted, oil shales and coal deposits would assure adequate supplies of liquid fuels for at least 1000 years.

Do you have any interesting facts about the oil business to pass along? We'll pay $10 for every item used in this series.

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cut mud, with water, in a drill stem test.

In the southwest corner of the Powder River Basin, Phillips Petroleum was unable to reach the Tensleep sand with the present size of the hole in a deepening operation at the first offset drilled in the new South Creek hole. The well was drilled to Leo at total depth of 10,207 feet, then plugged back for testing in the Lakota sand, which was productive in the discovery well. The well then flowed 258 barrels of oil in 24 hours, natural, after acidizing with 2,000 gallons.

Meanwhile, on the northeast side of the Powder River Basin, efforts to find new pools in deeper basin drilling west of the shallow Mush Creek, Skull Creek and Fiddler Creek fields are meeting with a degree of success.

Bay Petroleum Co.'s water-logged discovery in the Dakota sand at Lodgepole is making 25 barrels of oil and a like amount of water daily. A new offset, No. 1 Lottie Long, recovered only 40 feet of oil cut mud in a 22½-minute drill stem test of the Newcastle sand between 6,548-6,566 feet, and is being taken down to the Dakota sand for testing. It is located a mile northwest of discovery.

Esperado Mining Co.'s new discovery in northwest Lodgepole is shut down for repairs after swabbing 125 barrels of oil daily from the Newcastle at plugged back depth of 7,380. Two other lease holders in the same area, Bay Petroleum and Morton Oil Co., may drill a well near the Esperado venture this summer.

Another stepout at Hay Creek, Schlaikjer Bros.' No. 1 Sterling in section 33-46n-66w, recovered 200 feet of oil and gas cut mud in a 90-minute drill stem test in the Newcastle sand, topped at 6,190, after finding the deeper Dakota sand, at 6,402 feet, non-productive.

The California Co. is drilling below 11,245 feet in Pennsylvanian at Borie, eight miles west of Cheyenne, without finding any shows in the deeper levels. It is likely the well will be plugged back to the Muddy sand at 8,494 feet, where a new discovery was logged in a drill stem test which made 2,200 feet of 34 gravity oil in 55 minutes.

General Petroleum is drilling below 7,900 feet at the South Frisby wildcat which adjoins the Worland field to the southeast in Washakie county. The Frontier sand was logged at 7,345 and the well is being taken down to test Embar and Tensleep below 10,000 feet in what is considered the most important deep test in the Big Horn Basin this year.

The first failure in extension tests at the Worland field, discovered in 1946, may be listed at Trigood Oil Co.'s southeast extension at No. 1 Rideout, which made only a small amount of oil after heavy acidization of the Embar at a depth of 10,419 feet. Drilling development of the field is still rapid, with five rigs now running in the deep field. Pure Oil Co. is rigging up rotary on the 15th 10,000-foot Embar well; Sharples is drilling its fourth well in the field, and Trigood is on its fourth. Wiht production running better than 5,000 barrels per day, the Worland field, a seismic discovery, is rated as the fastest-growing field in Wyoming.

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desulphurization plant in the field, which will handle 30 million cubic feet of hydrogen sulphide gas per day, and Pure Oil Co. plans to build a natural gas stabilization plant to handle the sweetened gas. These by-product plants will turn out a large volume of commercial sulphur in addition to gasoline from recycling operations, returning unused natural gas by injection to the producing formation for pressure maintenance. At present the sour gas is being flared in the field.

Montana

Interest in Montana centered on the Devonian play north and northwest of Great Falls in the Sweetgrass Arch area with several tests scheduled to check on the prospects of oil production in coral reefs similar to those found in Alberta.

General Petroleum Corp., after several years of leasing and geophysical study in the area, picked a site near the crest of the south Sweetgrass Arch, a few miles south of the Pondera field, in Teton county. The location is in section 9-26n-4w on the Bouma ranch, in an area pinpointed with shallow dry holes that failed to find production in the top of the Madison lime.

It is estimated more than 100,000 acres have been leased in a trend generally running from Dupuyer, in southern Pondera county, to the Freezeout lake area of southern Teton county.

Sedimentary beds along the east flank of the Rockies thin out to the east in a long incline which ends on the crest of the South Arch. Tests drilled on the west flank of the arch will explore the possibility of coral reefs in the Devonian, as well as any other porous zones in that formation.

About 15 miles southeast of the General Petroleum wildcat, British-American Oil Producing Co. has staked a location at No. 1 Swenson in section 7-24n-2w, Teton county, for a Devonian test. Drilling of the venture will probably await the outcome of General Petroleum's test.

Four other Devonian tests in the general area have been staked by Montana indpendents. Several majors hold acreage blocks in the area, including Phillips, Hunt, Signal, Texas and Union Oil Co.

Continental Oil Co. is completing its deeper sand test on the apex of the west dome of the Cat Creek field in the Morrison, at 1,793 feet, after testing water in the deeper Ellis formation from 1914-1944 feet. The venture opens a new pay sand in the West Dome, which produces from the first and second Cat Creek sands. On a drill stem test in the Morrison the well made 1,035 feet of oil and 90 feet of mud in one hour.

Shell Oil Co. is drilling below 11,313 feet at Montana's deepest wildcat well, the No. 1 Crow Tribal at Ash Creek, in Big Horn county. The well had been shut down at 11,074 feet, in the Madison, pending a decision to deepen. No shows have been reported.

British-American is running production tests at its new discovery well at Clark Fork, Carbon county. The well was plugged back to 9150 feet to test the Phosphoria zone, which indicated commercial production in cores and drill stem tests. Don Edstrom, company geologist, said the geology correlates with

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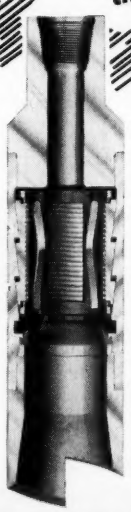

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The Melstone field in Musselshell county was extended a quarter mile eastward recently by Amerada Petroleum Corp.'s No. 4 Hougen, an east offset to the discovery. The well was completed last week for initial production of 241 barrels of oil per day, 33 gravity, through ¼-inch choke, with total depth at 4260. Amerada is seeking to extend the field to the northeast with Hougen No. 5, now drilling below 4300 feet after topping the Amsden at 3799.

Oil men balked at what they considered impossible lease terms when they declined to enter a single bid for a sale of tribal lands offered by the Blackfeet Indians at Browning, Mont., recently. A total of 15 tribal leases, all of them considered attractive oil prospects, were offered at the auction.

A spokesman for the oil men said the terms for leasing laid down by the tribal council removed all incentive for drilling. One requirement which drew forth objections said:

"The lessee will be required to drill a test well into the Madison lime unless oil or gas are found in paying quantities at a lesser depth, and to drill at least one well each year thereafter until there are as many wells as there are 40-acre tracts, or fractions thereof."

This was taken to mean that the the operator would have to continue drilling on 40-acre spacing even if the first well or subsequent wells were dry holes. The cost of drilling a well to the Madison in the area is placed around $40,000. Thus, on one lease covering 1,920 acres, the required drilling would run to nearly two million dollars.

G. N. McCabe of Cut Bank, Mont., has been named chairman of the Montana Oil Conservation Board. Other members are Jack C. Toole, Shelby; Peter A. Thomson, Billings; Ted Hawley, Conrad, and J. R. Engelking of Kevin. James A. MacGowan of Great Falls, was appointed secretary to succeed R. P. Jackson, retired.

UTAH

The unusual finding of oil in fractures in a shale formation at Carter Oil Co.'s No. 1 Ute Tribal well near Roosevelt, Utah, caught the interest of oil men throughout the Rocky Mountains last week.

Whether the well will be a commercial producer cannot be determined until further tests are made, explained C. L. Cooksey of Denver, division production superintendent.

At 8,768 feet the mud logger indicated a high gas reading and oil was observed in the drilling mud, after which a core between 8,770-74 recovered 3 feet 2 inches of dark gray fractured demolitic shale.

A drill stem test between 8,762-74 recovered 3,000 feet of 26 gravity oil and 300 feet of gas-cut mud in four hours through a ⅜-inch bottom hole choke. Gas reached the surface in an hour and a half and had a good blow throughout the test. Carter is coring ahead and will run Schlumberger electric log in search of more information.

"It is unusual to get a commercial well in a shale formation," said W. A. Bramlette, division geologist.

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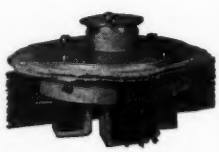

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"However, some production from shales has been obtained in the Rangely and Florence fields in Colorado and the Salt Creek and Teapot Dome fields in Wyoming, as well as a few ohter fields in these states. We will make every effort to develop the full commercial possibilities of this well."

Pacific Western and Equity have rigged up rotary to deepen the No. 1 Thompson wildcat in Grand county (33-21s-21e) below the 10,967-foot depth. Plans call for drilling through the Mississippian below 14,000 feet. The well was suspended in Pennsylvanian formations pending deepening operations.

At Big Flat in Grand county, Tide Water Associated is overcoming lost circulation at 6,368 feet in the Paradox salt formation. Saturation was found in the Paradox above the salt, but no shows have been logged below the top of the Paradox salt.

Rapid drilling development continues at Ashley Valley in Uinta county, Utah's first commercial oil field. Equity Oil Co.'s No. 3 well was completed flowing 25 barrels oil per hour from the Weber sand. Crane-Griffith Oil Co.'s No. 3 Hall, still testing, flowed 30 barrels oil per hour. A similar test was reported for Hollandsworth et al No. 1 Rennie. Several new locations were reported in May. The Utah-Vernal Oil Co., of Vernal, took a stepout two and a half miles east of production in the field proper at No. 1 Caldwell in section 2-5s-22e.

WESTERN CANADA

The long range effect of increasing Canadian crude oil production on markets for Rocky Mountain crude is a subject which pops up with increasing frequency wherever oil men gather in meetings or small groups.

Alberta's recently acquired self-sufficiency in oil production has already had its effect on markets for Wyoming and Montana crude. Toronto Pipe Line Co. formerly purchased a large volume of Wyoming crude for shipment by rail to Canadian refineries. These shipments were terminated early this year, and the only crude Toronto has on its hands now is about 200 barrels of condensate per day from Stanolind's Beaver Creek field in Fremont county. This has been sold to the Husky Refining Co., at Cody.

Of more concern, however, is the long range effect of Canada's booming production on the economics of the Rocky mountain area. This will begin to be more discernible when pipeline outlets are built from the Alberta fields to the head of the Great Lakes. Recently J. R. White, vice president of Imperial Oil, Ltd., told the Industrial Development Board of Manitoba that continued increasing oil reserves will warrant the heavy capital investment required for a pipeline from Edmonton to a lake terminal. Such a pipeline may be built and in operation by 1951.

In order to compete with American crude in middle west markets, however, the Canadian product would have to seek a lower price level, it is felt. It is currently selling at a higher figure than American crude.

If crude from western Canada moves by lake tankers to eastern Canada, it may have no appreciable effect on markets for Rocky Mountain crude in the middle west. It is estimated that Eastern Canada requires about 200,000 barrels of crude per day, which would take a good slice of potential Alberta and Manitoba production.

Meanwhile production of Alberta crude oil is held back by allowables set by the provincial authorities. Production during the first week of April dropped from plus 52,000 barrels daily to plus 48,000. The cutbacks were made to balance production with the quotas set for Leduc, Turner Valley and Redwater.

Industry spokesmen look for orderly development of oil resources in western Canada, contrasted with the feverish and wasteful drilling stampede that marked the early development of East Texas and disrupted the oil industry in the Rockies of that era. Practically all of Canada's vast petroleum prospects are owned by the government or the railroads and a conservative, long range plan of development may be anticipated over a long period of years.

More and more rigs are moving to Canada, but the pace has been slowed by the lack of pipeline outlets for crude outside the province of Alberta. By the first day of May it was estimated 80 drilling rigs were active in Alberta. A year ago there were only about 50 operating in the area.

Imperial's Golden Spike well, 20 miles west of Edmonton, produced an initial flow of 500 barrels of oil in one hour through open pipe, with production coming from 544 feet of Devonian pay—one of the thickest oil bearing sands reported in the western hemisphere. Production potential has been estimated at 35,000 barrels per acre.

A pipeline outlet for the Golden Spike field was assured recently when Imperial Pipeline Co. started laying an 8-inch line between the Golden Spike and Woodbend fields. The firm is a subsidiary of Imperial Oil, Ltd., Standard of New Jersey affiliate in Canada.

Development of the new field is moving right along. Imperial is drilling an offset two and one-half miles northeast of the discovery, and another offset is being drilled two and a half miles west of the discovery.

A searching look at Canadian oil development is taken by the April, 1949, issue of the Bulletin of the American Association of Petroleum Geologists. The entire issue is devoted to a discussion of Alberta's oil geology, as well as prospects in other western provinces.

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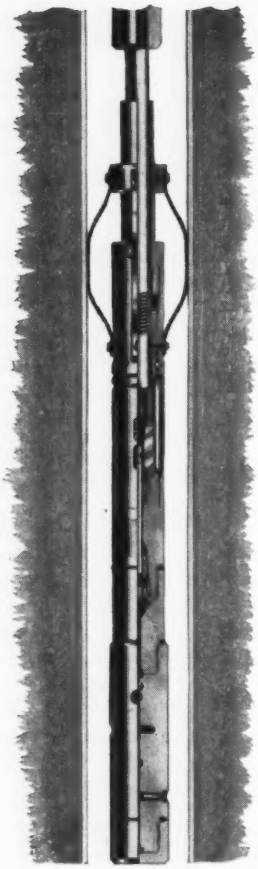

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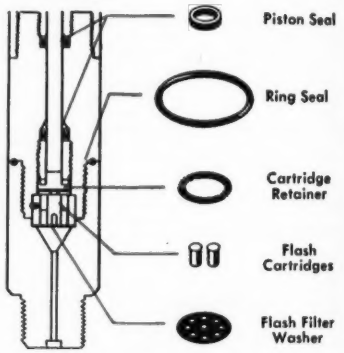
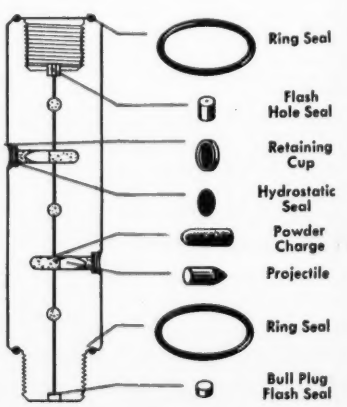
THE FEW EXPENDABLE SUPPLIES illustrated are *all* that are needed for each Johnston Gun Perforating Job. After cleaning and drying the Firing Head and Perforating Gun Section, these few parts are easily replaced during normal reassembly. Individual Firing Chambers of each 4, 5 or 6-shot Perforating Gun Section are hand-loaded and need only a light portable hydraulic capper to assure precision alignment of the retaining cups over the firing chambers.

The Firing Head of the Johnston Gun Perforator requires no special tools or fixtures to effect complete reassembly. The Sealing Rings, Piston Seals, Flash Washers and two 32-calibre cartridges are negligible in cost and can be replaced right on the rig floor. Belly Springs need be replaced only when friction-worn beyond their ability to hold tension. Tension can be re-set before each run.



FIRING HEAD EXPENDABLE PARTS



GUN SECTION EXPENDABLE PARTS

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SAFE GUN PERFORATOR OPERATION! The Johnston Gun Perforator affords utmost safety in all phases of gun perforator operation. It will not fire until subjected to both in-the-hole hydrostatic pressure and top-hole manipulation by the driller.

PORTABILITY AND FLEXIBILITY! The Johnston Gun Perforator can be transported in the back of your regular field car! And after arriving at well location, you attach only the number of 4, 5 or 6-shot Perforating Gun Sections needed for that particular job.

EXACT POSITIONING IN PRODUCING ZONE! Accurate placement of the Johnston Gun Perforator opposite the zone selected for perforating is easily determined by your own pipe-in-the-hole tally. No rigging up of special measuring devices is necessary.

POSITIVE FIRE OF ALL PROJECTILES! The safe, fool-proof hydrostatic firing principle of the Johnston Gun Perforator Firing Head coupled with the flash-hole design of the Perforating Gun Sections insures positive fire of all projectiles.

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Newhall Area Active Center

In what is described as a three-cornered deal, von Glahn Oil Company has entered the Placerita sector at Newhall by acquiring 200 acres of the 360-acre La Salle lease. Ben Hur Refining and Imperial Development are property holders on the same lease and reportedly share interest in a shallow test planned by the von Glahn organization on Sec. 10-3n-16w, one mile west of Placerita production. A score of wells are currently busy in the area. J. Ramon Samovia's Juanita No. 2 on Sec. 31-4n-15w flowed at the rate of 720 barrels a day from 1942 ft. on open hole production test. Allen Guiberson's Schisler No. 2 is in at 1642 ft. for 70 barrels daily. An initial of 440 barrels a day greeted Gordon Oil Company's Peggy Moore No. 1 on Sec. 31-4n-16w when the final touch was added at 1775 ft. Algord Oil Company, meantime, has completed Shepard No. 1 at a plugged depth of 1779 ft. for 75 barrels. Independent Exploration Company has staked Royal Comm. No. 1 wildcat on Sec. 30-4n-16w. This is an extension test of present production in the area. Northwest of Newhall, General Petroleum is drilling at 1892 ft. with Circle J No. 1 on Sec. 26-4n-16w on the ranch by the same name.

Carlsbad Test Works

Having cemented surface pipe at 78 ft., Charles Holmes is drilling ahead below 350 ft. with Holmes No. 2 wildcat on Sec. 31-11s-4w at Carlsbad in San Diego County.

Signal Hill Lively Area

The deep zone play at Signal Hills is the most lively area in California. There are 20 rigs running, with more anticipated. Acme Drilling Company is about to start the drill in Farrell Two No. 1 on Sec. 24-4s-13w. The company recently finished Bauerdorf No. 1 on the section at 10,140 ft. for 152 barrels daily. On the same section, Atlantic Oil Company is drilling Dodge No. 3 and Douglas No. 1 at 9890 and 6823 ft., respectively.

West Coyote Wildcat Staked

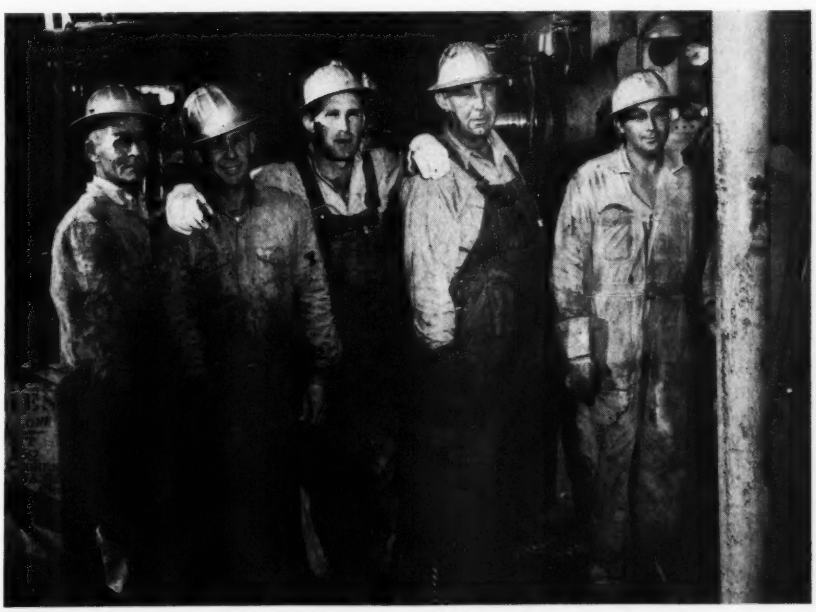
Three-quarters of a mile from wells producing in the West Coyote field in Orange County, Barnsdall Oil Company is grading location for Emery Trust No. 1 deep test on Sec. 25-3s-11w. It will be a no dope well. Hathaway Oil's Merritt No. 1 on Sec. 21-3s-9w at East Coyote is coring and drilling at 4250 ft.

Meadowlark Wildcat Digs

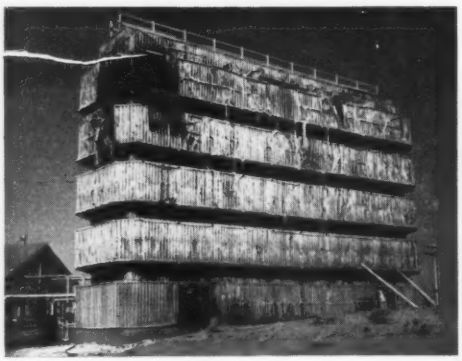
In the Meadowlark area of Orange County, Shell Oil's Kettler No. 5-22 explorer is drilling steadily ahead at 7571 ft. The well is on Sec. 22-5s-11w.

Inglewood Test Drills

In the East Inglewood area, several miles from the fire-gutted Hollywood Turf Club, Shell Oil is drilling and coring at 10,976 ft. in its



Another Crew on Herley-Kelley Company's Fee #1, Signal Hill field. Left to right: Willis Hardesty, backup; B. L. Routh, pipe racker; Max Sherrill, derrick; R. W. Hughes, cathead; and Fred Klugkist, driller.



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Baldwin Hills No. 1 on Sec. 9-2s-14w. Standard of California's L. A. I. No. 1-100 on Sec. 17-2s-14w is rigged.

Dominguez Well Flows

Severns Drilling Company, contractor, has completed Union Oil's Callender No. 117 on Sec. 3-3s-13w in the Dominguez field at 8658 ft. Present yield is 751 barrels of oil and 270 cubic ft. of gas daily.

Weldon Canyon Project Drills

At Weldon Canyon, Los Angeles County, Richfield Oil is drilling Watson No. 1 beyond the 2900-ft. level on Sec. 13-3n-16w. The company's Garvey Hills wildcat on Sec. 27-1s-12w in Monterey Park is ready to start the drill.

Lawndale Well Digs

Sunray Oil Corporation's Johnson No. 44 on Sec. 17-3s-14w in the Lawndale field is drilling at 783 ft. Surface pipe is set at 1569 ft.

Castaic Try Digs

Coring operations are continuing at 4000 ft. in Atlas Oil Company's Acosta No. 1 wildcat on Sec. 24-5n-16w near Castaic in Los Angeles County. Bert Brunwin is drilling superintendent.

Puente Test Drills Ahead

Near the town of Puente, Puente Oil Company's Jasper Isaacson No. 1 test on Sec. 7-2s-9w is exploring at 2200 ft.

West Newport Well Completes

Surfland Oil Company has run liner and is completing its Newland No. 6 on Sec. 12-6s-11w in the West Newport area. Bottom is 3257 ft., with casing set at 3208 ft.

Ramona Job Digs

In the Ramona field, Texas Company is drilling on down at 750 ft. with its Kern No. 31 on Sec. 7-4n-17w.

Mint Canyon Test Planned

Sunol Oil Company of San Jose has some 800 acres of the Baker and Liebes properties in the Mint Canyon area, with a test well for the lease under consideration. President of the company is Harry A. Houser.

Corona Try Quits

The wildcat at Corona in Riverside County has been abandoned by Elkhorn Petroleum Company, the operator. Located on Sec. 28-4s-6w, the well explored to a depth of 950 feet.

Chino Hills Well Reaming

Grayco Oil Company's Grayco No. 1 test well on Sec. 13-3s-8w in the Chino Hills of San Bernardino County is underreaming. Total depth is 4096 ft., with 8⅝-in. casing set at 3505 ft.

Wilmington Drill Program

Atlantic Oil Company has embarked upon a new program of four new drilling jobs in the Wilmington field. They are No. 58, No. C-11, No. C-12 and No. S-13 on Sec. 29-4s-13w.

Whittier Well Good

Union Oil Company has completed Sansinena No. 19 on Sec. 30-2s-10w in the Whittier field. Present yield from 4666 ft. is 374 barrels daily. No. 20 on the section is drilling ahead at 875 ft.

Tar Springs Test Drills

Drilling is proceeding at 1645 ft. in the Mar-Roo Syndicate O'Reilly No. 1 test well at Tar Springs, Sec. 26-28s-12e, San Luis Obispo County.

Richfield Jobs Drill

Kraemer Oil Estates is digging deeper at 800 ft. with Kraemer Fee No. 17 on Sec. 36-3s-9w in the Richfield field. On Sec. 30-3s-9w, Union Oil's Placentia No. 1 is making hole at 2521 ft.

Coastal and Northern District

Bardsdale Try Spuds

Shell Oil's Dryden No. 1, a southeast extension test of lower Eocene production developed in the Bardsdale area has been spudded. The well is on Sec. 7-3n-19w. Union Oil, meanwhile, is drilling near 6500 ft. with its Dryden No. 20 on Sec. 12-3n-20w.

Arbuckle Test Digs

Standard of California's interesting gas test well in the Arbuckle area of Colusa County is drilling on down below 1000 ft. It is called Elsey Estate No. 1 and is on Sec. 31-14n-1w, between gas fields at Dunnigan Hills and Colusa.

Willows Try Deep

Drilling has reached 10,200 ft. in Shell Oil's James No. 1 wildcat in the Willows area in Sec. 1-19n-9w, Glenn County. Some difficulty was occasioned around present level by hole caving.

Petaluma Try Starts

Starting in the Petaluma area of Sonoma County is V. O. Porter's Bettinelli No. 1 test on Sec. 32-5n-6w. Petaluma is probably the world's greatest poultry raising center.

Rio Vista Well Fishes

With top of fish at 5877 ft. and bottom at 7970 ft., Amerada Petroleum's McCormick No. 4 on Sec. 36-4n-2e in the Rio Vista area of Solano County is temporarily stalled at 11,051 feet. The fishing job is progressing.

Tepisquet Creek Wildcat Begins

Drilling away in the shallower formations is Dan Fisher's Rancho Viejo No. 1 explorer on Sec. 33-10n-32w, near Tepisquet Creek in Santa Barbara County. His Hollister Rancho No. 1 in the Goleta area on Sec. 3-4n-29w was last reported pumping water with a scum of oil from plugged depth of 735 ft. Total bottom is 1428 ft. Honolulu Oil's State No. 309-3 on Sec. 19-4n-28w at Goleta is redrilling below 8200 ft. The hole was carried first to 8197 ft.

Somis Tests Still Working

In the Somis sector of Ventura County, General Petroleum's Los Posos-McBean No. 1 wildcat on Sec. 34-3n-20w is drilling at 3006 ft. Humble Oil is drilling at 1400 ft. with Berlywood Inv. No. 1 on Sec. 5-2n-20w.

Summerland Well Pumps

Pumping 7 barrels of 32.9 gravity oil a day, Loon Point Oil Company has finished at 2649 ft. Bailard No. 2 on Sec. 23-4n-26w. Total depth is 2649 ft., with 7-in. casing cemented at 2470 ft. Standard Oil is drilling ahead near 900 ft. with its Ortega No. 1 in Sec. 16-4n-26w, after setting surface pipe at 507 ft.

Conejo Try Works

Having sidetracked fish, Sunray Oil Corporation has cemented 5¾-in. pipe at 7020 ft. in its Janss No. 1 on Sec. 33-2n-19w, in the Conejo area, Ventura County.

Simi Test Spud Due

M. H. Marr is about to spud Marr Ranch No. 17 in Sec. 31-3n-17w. in the Simi area of Ventura County. R. E. Havenstrite's Tapo No. 1 in Sec. 13-3n-18e has been abandoned. It went to an unproductive 8399 ft.

Monterey County Interest Widens

In the Vineyard School area of Monterey County, C.C.M.O. Company last was reported making hole at 3789 ft. with Silva No. 1 wildcat on Sec. 23-24s-12e. Near Watsonville, Hammer-Glidden Corporation has reached 1200 ft. in its Tiffany No. 1 test well on Sec. 31-12s-2e. Humble Oil & Refining's J. J. Barbree No. 1 venture in the

K. L. Kellogg and Sons, drilling contractors on Atlantic Oil Company's Dodge #3, Signal Hill field. Rear row left to right: M. G. Wade, helper; E. V. Rowe, helper; T. W. Parcel, driller. Front row left to right: Jeff Martin, helper; L. J. Mehichini, derrick and L. W. Ham, helper.

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San Lucas area in Sec. 21-21s-8e is prospecting ahead around 4100 ft. On the Edgar Anticline, Texas Company has pulled out of its Edgar No. 1 in Sec. 12-32s-19e, after going unsuccessfully to a total depth of 6568 ft. Electric log was run to bottom. Standard Oil's Hillman No. 1 wildcat on Sec. 25-24s-14e last was reported digging at 4920 ft. The company is rigging Walti No. 1, another wildcat in the Slack Creek area on Sec. 34-21s-12e. Between Texaco and the Jergins-North American combination there are a dozen wells at various stages in the San Ardo area.

Santa Cruz Test Rigging

Union Oil is rigging up to start the drill in its Loma Prieta No. 1 exploratory well on a large block of leases in the Bean Hill area, Santa Cruz County. Location falls in Sec. 19-10s-1e.

Calabasas Try Works

Eagle Oil & Refiining's exploratory project on Sec. 4-1n-17w in the Calabasas area is nearing the spudding stage.

Bradley Area Wildcatting Due

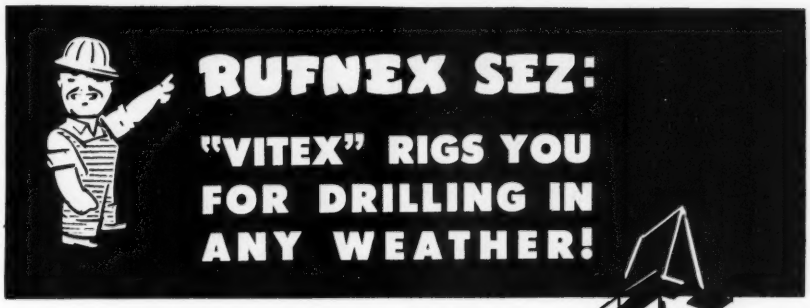
B. F. Porter Estate of San Francisco has staked location for Porter No. 1 wildcat on Sec. 36-23s-10e in the Bradley area, Monterey County. Drill site is about six miles south of production at San Ardo.

Timber Canyon Adds Producer

In the Timber Canyon field, Richfield has added E. P. Clark No. 4 on Sec. 14-4n-21w. It came in at 2410 ft. for 176 barrels a day. No. 5 on Sec. 13-4n-21w is drilling at 1245 ft.

West Mountain Deep Test Digs

Los Nietos Company and Lucy Smith Battson's C. & H. No. 10 deep test on Sec. 23-3n-21w in the West Mountain field is drilling at 10,250 ft. The project picked up interesting showings in the last several hundred ft. of hole. Ring Oil's Santa Paula No. 1 on the section is idle temporarily at 7971 ft. It also is a designated deep test.



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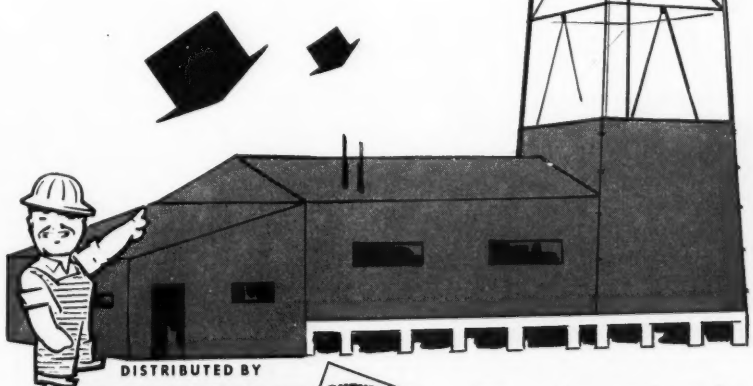

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San Joaquin Valley

Paloma Test Starts Work

Humble Oil & Refining Company is ready to begin drilling in its new and important wildcat venture in the Paloma area of Kern County. The test, KCL No. 54-9 on Sec. 9-32s-26e, is on property taken by Humble from the Kern County Land Company. The ground in question is understood to take in the major part of the south flank of the Paloma field. Drill site is about one mile from production. The field is an anticline of approximately eight miles in length. However, so far there has been production only on the north flank. Structural apex and the southern border have undergone considerable testing, but sands encountered were so tight they failed to yield oil. Some months ago Superior Oil encountered a new deep sand 800 or 900 ft. thick. The well gave up nothing but a little salt water, but the thick sand measures enhance prospects of the area in the eyes of most geologists. Humble's present undertaking is scheduled to probe both the regular Paloma zones and the prospective deeper sand. Exploration may go as deep as 14,000 ft. Ohio Oil's KCL-A No. 61-21 on Sec. 31-31s-26e has been abandoned at 12,995 ft. On the calendar for immediate deepening is C.C.M.O. Company's No. 23-25 in Sec. 35-31s-26e. Originally a north extension test, present depth is 11,740 ft., with top Paloma sand placed at 11,606 ft.

Trico Test Drills Ahead

Trico Oil & Gas Company is drilling ahead below 3000 ft. with its Trico-Independent Exploration-Sawyer No. 1 wildcat in the Trico area. Drilling came to a temporary halt to change over to heavy drilling equipment. Prime objective is the Mya sand.

Calder's Corner New Valley Field

General Petroleum's newly discovered field in San Joaquin Valley has been named Calder's Corner. The discovery well, KCL-Calder No. 38-23 on Sec. 23-29s-25e, is putting out 154 barrels of 34.5 gravity oil a day through a 11/64-in. bean from a plugged depth of 8835 ft. Gas output is 202,000 cubic ft. daily. Total bottom is 12,733 ft. Production evidently is coming from 26 ft. of Stevens zone from 8808 to 8834 ft. The new field is about two miles west of the Greeley field. In addition to General Petroleum, the opening of the new oil area will benefit Richfield and Universal Consolidated. Richfield holds property a half mile north of the well and Universal Consolidated a quarter of a mile southeast. Sand is thick in the new well, but it may thicken at locations following. A southerly offset well is planned for the 160-acre Sturdevant property held jointly by General Petroleum and Universal Consolidated. General Petroleum will be the operator. In the San Emidio area, General is drilling and coring below 2900 ft. with Heard & Painter No. 27-3 on Sec. 3-11n-24w.

Santos Creek Wildcat Digs

Near Santos Creek in Kern County, C.C.M.O. Company's Santos No. 1 wildcat on Sec. 32-28s-20e is making hole at 800 ft. Location is about a mile and one-half southwest of wells producing in the Bacon Hills area.

Coalinga Try Drills

Walker & Pray is prospecting on down below 6700 ft. with its Nidever No. 1 test well on Sec. 24-20s-15e in the Coalinga area. Atlantic Oil's No. 77-25T on Sec. 25-19s-15e blew gas in substantial quantities from intervals tested between 3786 and 4480 ft. Drilled to a bottom of 5188 ft., the project will perforate and try lower.

Turk Anticline Venture Reaming

In the Turk Anticline area near Cantua Creek, Humble Oil & Refining has reached 9780 ft. in hard gray sand with S.P.R.R. No. 1 on Sec. 25-18s-16e and is reaming.

Sheep Springs Wildcat Spuds

Spudded and drilling ahead in the shallower formations is Carneros Oil Company's Anderson Comm. No. 3 wildcat on Sec. 19-29s-21e in the Sheep Springs area.

Hancock Oil Company's well No. 35 in the Signal Hill field. K. L. Kellogg and Sons drilling contractors. Rear row, left to right: J. C. Gregory, pipe racker; M. A. Hackler, derrick; W. N. Karher, driller. Front row, left to right: C. E. Jones, cathead; C. H. O'Neill, helper.

San Emidio Test Drills

E. E. Combs and Fox M. Boswell are drilling ahead at 2930 ft. with Robinson-Wagonwheel No. 1 on Sec. 11-10n-23w at San Emidio in Kern County.

McDonald Try Digs

Exploration is moving ahead at 4280 ft. in Continental Oil's Texas Fee No. 1 well on Sec. 8-28s-20e in the southeast McDonald area, Kern County.

Jasmine Test Dry

At Jasmine in Kern County, Hancock Oil's Marquis No. 1 on Sec. 31-25s-27e is a duster at 4500 ft. The Vedder was topped at 3540 ft. and the Walker at 4264 ft.

Tejon Wells Oil Failures

Two wells have abandoned in the Tejon area. Henry Lubking gave up at 1046 ft. his No. 1-16 on Sec. 33-12n-18w. B. C. Mackey pulled out of Whiteoak No. 1 on Sec. 12-11n-18w at 260 ft. Richfield Oil's Tejon No. A54-15 is Sec. 15-11n-18w is putting out 12 barrels a day of net oil from plugged bottom at 655 ft. Rainbow Oil's Rainbow No. 5 on Sec. 11-11n-18w is pumping an estimated 75 barrels a day from 615 feet.

Cymric Try Quits

Oceanic Oil's Williams No. 1 wildcat on Sec. 2-30s-21e near Telephone Hill in the Cymric area has quit at 1536 ft. The well blew considerable gas from the interval of 1282-1350 ft. on formation test.

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Kettleman Hills Project Interests

Middle Dome Corporation ran a test of the interval of 12,030-12,286 ft. in its No. 52-30V on Sec. 30-23s-19e at Kettleman Hills Middle Dome. The results of the test showed a flow of 1000 barrels through a ¼-inch bean cutting 50% water. Gas output was 5,000,000 cu. feet.

Temblor Nose Venture Digs

Venturing for new oil in the Temblor Nose area, Seaboard Oil Company has reached 4600 ft. with its Anderson No. 1 on Sec. 6-30s-21e, where drilling and coring are the order of the day.

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Blackwells Test Drills

Test drilling is going on down at 8350 ft. in Superior Oil Company's O.L.C. No. 4 on Sec. 26-26s-19e at Blackwells Corner. No. 5 on Sec. 16-26s-19e is rigged up. Superior shares interest in the play with Independent Exploration Company.

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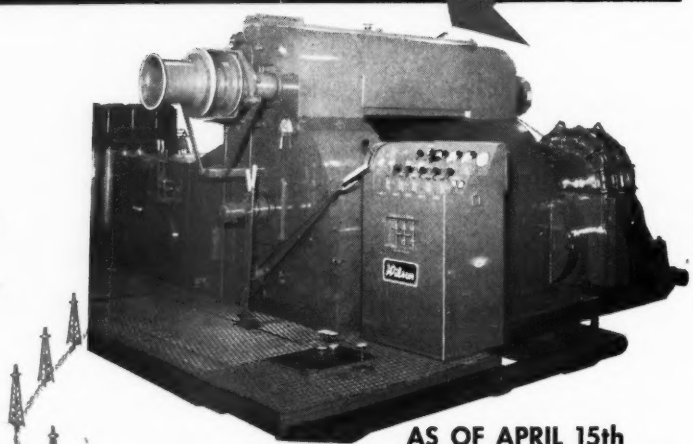

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Santa Fe Drilling Company, which has been drilling wells everywhere in California, appears to be bent on also operating in South America. Activities in the lands of the beautiful senoritas will be carried on under the banner of Santa Fe Drilling Company of South America. Directors are J. D. Robinson, R. A. Powell and R. E. Battershy.

America's oil tool manufacturers visualize wells going to as deep as 25,000 feet in the not too distant future. The American Petroleum Institutes figures that the country's oil industry has drilled some 1,250,000 wells since Edwin L. Drake completed the first well in 1859 at Titusville, Pa. Total footage of about 2,500,000,000 is equivalent to drilling 60 holes through the center of the earth. API estimated 1949 drilling to exceed 100,000,000 feet.

Brown Drilling Company has been awarded contract to drill Standard of California's Elsey Estate No. 1 gas test in the Arbuckle area of Colusa County.

E. C. (Ned) Brown, president of Brown Drilling Company of Long Beach, has completed an inspection tour of company activities in the Persian Gulf area. He flew from New York by TWA Airlines. During his stay in the Persian Gulf area he visited company contract operations at Saudi Arabia and Bahrein Island. The company has been drilling wells for Arabian American Oil Company at Saudi Arabia for the last two and one-half years. Brown's contract work at Bahrein Island is for the Bahrein Petroleum Company. The company in the near future may extend its contract operations to wells in the so-called Kuwait neutral zone.

Jack N. Westsmith has been appointed director of public relations of the American Association of Oilwell Drilling Contractors at Dallas. His duties include public relations and membership work. He succeeds Jeff Young, who resigned three months ago. Westsmith, a graduate of Stanford University in 1928, majored in mechanical engineering.

A. D. Rushing Drilling Company was contractor on Richfield Oil's Homan No. 1 discovery well at South Cuyama. All Richfield wells in Cuyama Valley are contract jobs. The discovery well is on land owned by Glenn J. Homan, Glendale resident.

Expansion of oil development in Canada has prompted the American Association of Oilwell Drilling Contractors to initiate a series of mud schools at Edmonton, Alberta, in cooperation with the University of Alberta. To assist the university in the operation of the schools a committee was set up at an organization meeting in Calgary. T. H. McIvor is chairman. Other members of the group are Archie Miller, Cody Spencer, D. W. Harris and V. T. Moroney.

Thomas P. Pike Drilling Company, contract driller for Basin Oil Company in the Inglewood field, has moved five of its 10 steam boilers on Community No. 5-2 to a location more remote from the residential district. Pike also plans to move other equipment to a new location. W. E. Sauder and W. A. Jones are drilling foremen on the project. Current Pike drilling jobs include Royalty Service Corporation's Riverside No. 2 at Athens-Rosecrans. Drilling foreman is L. P. Crabtree. At Signal Hill the contractor is completing D. D. Feldman's Woolner No. 1, with operations in charge of R. W. Smith. Duty No. 1 is being drilled in the same field for Walker & Pray, with L. R. Mondotte, drilling foreman. Jergins Oil and North American Consolidated No. 28-11 at San Ardo is another Pike drilling job. With final touches to this well, equipment will move to a location on the same lease, Clarence Cramer, foreman, reported. The contractor is drilling three wells for Standard-Navy in the Elk Hills field. Drilling foremen there are J. H. Swain, Verne Coates, W. G. Klassen and A. E. Kirkland. Well No. 363-5G is using Pike's 136-ft. Ideco heavy duty drilling mast, with an 800,000-lb. capacity. In the Coalinga field, H. C. Patterson is foreman on Nidever No. 1 contract job for Walker & Pray.

Back at his Los Angeles office is W. W. (Bill) Cline from a business trip to Texas oil areas. He is president of San Joaquin Drilling Company.

C.C.M.O.'s Santos Creek wildcat called Santo No. 1 is drilling under contract with Masters Drilling Company.

Completion of J. Ramon Samovia's Juanita No. 2 at Placerita by Gene Reid Drilling Company has been announced. On open hole production test the well flowed more than 700 barrels a day.

Personalities IN THE NEWS

Crowley Named Vice Pres. of Jorgensen Co.

Leonard F. Crowley, well known in Southern California industrial circles, has been appointed a vice president of Earle M. Jorgensen Co., steel distributors, with plants in Los Angeles, Oakland and Houston.

Leonard F. Crowley

Born in New Bedford, Massachusetts, Mr. Crowley came to Los Angeles in 1921, starting work in the cost department of the Baker Iron Works. Two years later he was advanced to assistant purchasing agent, which position he occupied until 1929, when the Baker Iron Works, Union Iron Works and Llewellyn Iron Works consolidated into the Consolidated Steel Corporation, which in turn became today's Consolidated Western Steel Corporation.

Upon leaving Baker Iron Works in 1929, Mr. Crowley joined forces with the Earle M. Jorgensen Co., starting work on an order desk. He has advanced through practically every position in the procurement and sales divisions of the company, at one time having been manager of purchases and at another time assistant manager of sales. Thus he has worked on both sides of the desk—buying and selling.

In his twenty years with the Jorgensen company the firm has grown from a comparatively small concern to one of the largest distributors of steel in the country. In fact, the Houston branch, which was not in existence in 1929, is now more than triple the size of the home office—Los Angeles—at the time Crowley joined the company. In recent years his chief responsibility has been to train men for key spots in a rapidly expanding organization. He has the happy faculty of being able to transmit his vast fund of knowledge to others. Many steel users have formed the habit of calling upon him for advice when confronted with a steel problem. This was particularly true during World War II when his knowledge of the steel busines in general, and sources of supply in particular, was of invaluable assistance to many a harried purchasing agent in those hectic days.

George C. Atha, West Newport oil producer and prominent geologist, is back in Los Angeles from an extended trip to Mid-Continent and Midwest points. His tour took him to Dallas, Oklahoma City, Dubuque, Lansing and Chicago.

Raymond L. Geiler, previously executive vice president of A. R. Maas Chemical Company, has been appointed president. He succeeds Holger Stougaard, deceased. Thomas F. Edson has been named to succeed Geiler as executive vice president. Fred C. Bowman, director of research, was elevated to vice president of the South Gate company.

John Wents, widely known Los Angeles consultant geologist and petroleum engineer, has been elected to the board of directors of Tide Water Associated Oil Company. Prior to his election on the Tide Water board, Wents was named to the board of the Mission Development Corporation. A graduate of Stanford University, Wents has spent the greater part of his business life in the development of fields in California.

Appointment of Ben F. Avery as manager of distributor sales for Seaside Oil Company, was announced by R. J. Irvin, vice president and general sales manager. Avery, a fortress pilot during the war, will make his headquarters in Santa Barbara.

Calvin James Dean, 50, senior petroleum engineer for General Petroleum Corporation, died at his South Pasadena home. Dean, a graduate of the University of California, joined the oil company in 1923 and during the next two years worked in the fields near Fullerton. He was made an assistant geologist in 1925 and in the following year moved to the Bakersfield area, where he worked for six years as a geologist and petroleum engineer.

Charles R. Clark, San Francisco sales manager for Tide Water Associated Oil Company, has announced that Walter J. Jacobson has been named sales agent at Avon, replacing Hobart Young.

Keans, Springmann and Stipek announce the removal of its offices to the new General Petroleum Building in Los Angeles. The company is designed to serve the oil industry in the acquisition and administration of lands and leases for oil and gas exploration and development.

Fluor Appoints McKay

The Fluor Corporation, Ltd., Designers, Engineers, and Constructors for the petroleum, chemical and power industries, announces the appointment of Jack E. McKay as Manager of Advertising and Public Relations. McKay assumed this new position following three years as assistant to J. P. Wiseman, Vice-president and Director of Sales for the Fluor Corporation.

Jack E. McKay

Prior to joining Fluor in 1942, McKay was associated with The Carter Oil Company in Tulsa, Oklahoma, and the Sinclair Refining Company in Sand Springs, Oklahoma.

R. P. Mangold and G. H. Wells of the Independent Exploration Company discussed "Structural Features and Reservoir Performance of Salt Creek Field Unit" at the meeting of the API San Joaquin Valley chapter at Standard 11-C meeting hall in Taft. Accompanied by color slides, E. M. Bien, Chinese Geological Survey, spoke on "Review and Development of Petroleum Exploration in China."

Don Smith, popular petroleum engineer, was among the first to recognize the production possibilities of the deeper zones at Signal Hill. He has been of particular help to many operating organizations shooting for the De Soto zone.

During his Southern California sojourn, Secretary of the Interior Julius A. Krug was guest of Reese H. Taylor, president of Union Oil, at the company's Wilmington refinery. The company developed its shale oil extracting pilot retort at the refinery, which prompted the visit. The retort was developed under the principal direction of Dr. Clyde Berg, 34, supervisor of Union's plant process division.

Officials of Union Pacific Railroad, large oil producer in the Wilmington field, were recent Los Angeles visitors, having come from Omaha headquarters. The officials were Arthur E. Stoddard, who became president March 1, last; E. Roland Harriman, board chairman, and Ambrose J. Seitz, executive vice president.

Charles S. Jones, president, and Frank A. Morgan, vice president and manager of exploration, Richfield Oil Corporation, were hosts to a party of newsmen on a trip by air to Cuyama Valley. Two large Douglas planes were chartered by the company to provide comfort and speed for the members of the press, which viewed the bringing in of the Homan No. 1, South Cuyama discovery well.

William Robert Saylor, 34, a boiler station operator, was killed on an oil lease near Ventura when a boiler he was tending exploded. Saylor resided in Casitas Springs.

Fred Thut has returned to his duties with the Southern California Gas Company in the San Joaquin Valley division, following a recent illness.

Contractor on Gilliland Oil Company's Logan Green No. 4 at Devils Den is John Speirs Drilling Company.

Inman & Kirchhof Enter Contract Drilling Business

C. W. Inman and L. L. Kirchhof have formed a new contract drilling company to be known as the C. W. Inman Company. At the present time they are on Janss No. 1, in the Thousand Oaks area of Ventura County. Mr. Inman's experiences in the oil industry date back to 1916, when he began work for the Shell Oil Co. He stayed with Shell until 1931, and since then has been connected with Kettleman North Dome Assn., Bell and Loffland, Inc., and British American Oil Producing Company. During his many years in the drilling and production end of the business, he has been in all major California Oil fields and is well equipped for his new work.

Mr. Kirchhof, who will be in charge of field operation, has been in the drilling and production business since 1920. From 1936 to 1946, he was Supt. of Drilling and Production for the Belair Oil Company, and from 1946 until 1949, Drilling Supt. for Sunray Oil Corporation, Santa Maria.

C. W. Inman

L. L. Kirchhof

Signal Makes Executive Promotion in Production Dept.

Richard H. Smith has been appointed General Production Superintendent of the Signal Oil and Gas Company in a series of promotions announced by Walter Greenfield, Manager of the Oil Producing Department of that company. He succeeds E. L. "Gene" Davis, who has resigned to accept a position with the Arctic Contractors conducting operations in Alaska.

Walter Greenfield Announces Promotions

Named to assist Smith were Harry C. Meyer, Assistant General Production Superintendent, and Paul Andrews as Chief Production Engineer. For some time past Smith has been in charge of the reservoir engineering studies for Signal and its affiliated companies. Prior to his association with Signal he was for many years with the Kettleman North Dome Association. He received his technical training at Cal Tech and U. S. C. and at the present time is National Vice Chairman of the Production Technology Committee of the A.P.I.

Richard H. Smith Named General Production Supt.

Harry Meyer leaves the position of Lease Superintendent of the company's Bolsa properties at Huntington Beach to take over his new duties as Assistant General Production Superintendent and will make his headquarters in Los Angeles. A member of Signal organization since 1936, Meyer brings a wide experience in oil production to this position gained with various companies in the Long Beach area. This oil field experience was preceded by work taken at the University of Minnesota.

Paul Andrews assumes new duties as Chief Production Engineer for the company and has been with Signal for many years. This promotion is one in a series of advancements for him. A University of Utah man, Andrews at the present time is chairman of the Pacific Petroleum Chapter of the A.I.M.E. and national chairman of the Topical Committee on Production Practice of the A.P.I.

In another announcement, Greenfield also named C. C. "Larry" Liedhold Chief Petroleum Engineer. Liedholm is a graduate of the University of California and has been a Signal man since his graduating.

Lieut. Gov. Goodwin J. Knight was the keynote speaker at the American Petroleum Institute banquet in the Biltmore Bowl. His subject was "Politics Is Your Business." Some 1200 Pacific Coast oilmen were in attendance at the banquet.

W. G. Krieger, president of Douglas Oil Company, has announced the appointment of John J. Stanko as manager of the asphalt processing division.

Edward A. Rankin, who has been appointed by Jack Manildi, president of Mell O. Haldeman Corp., as oil field salesman. Rankin has had wide experience in the California oil industry, having worked for several years with The Texas Co. of California in pipe line, refining and sales work. He has also had several years of oil field selling with one of the large California manufacturers.

E. W. Masters, Regional Production Manager for Shell Oil Company has announced that B. P. Eastin has been appointed Regional Exploitation Engineer. Eastin replaces W. C. Chonette, who was recently made Division Manager, Los Angeles Basin Division.

Ben R. Meyer, of the Union Bank & Trust Company in Los Angeles and widely known in oil circles, left for Europe and the Middle East. He will spend a week each in London and Paris before proceeding on to Tel Aviv and Jerusalem.

Magoffin Transfers Kerbo

J. P. Magoffin, general sales manager Patterson-Ballagh, Division of Byron Jackson Co. recently announced the addition of George Kerbo as sales representative at the Odessa, Texas office.

"Response to the newly designed Patterson-Ballagh casing and drill pipe protector has necessitated Kerbo's joining the Odessa office," Magoffin said. Kerbo has been with Patterson-Ballagh for three years and goes to Odessa from the office at Casper, Wyoming.

THIS LAUGH OFF!!

"Are you a good little boy?"

"Nope. I'm the kind of a boy my ma doesn't want me to play with."

A nice girl doesn't accept gifts of mink
Or diamonds, rubies or pearls,
And, I've made it perfectly clear, I think,
That I'm one of the nicest of girls.
Mother has told me about these things,
So you mustn't try turning my head
With your gifts of mink and diamond rings,
Just give me the money instead.

"Bet you think I'm a perfect idiot."

"Nope. Nobody's perfect."

Policeman: "Did you see the number of the car that knocked you down, madam?"

Woman: "No, but the woman in it wore a black turban trimmed in red. And her coat was imitation fur."

Boss: "What's this big item on your expense account?"

Salesman: "Hotel bill."

Boss: "Well, don't buy any more hotels."

Doctor: "Why did you have 764023 tattooed on your back?"

Patient: "That isn't a tattoo. That's where my wife hit me with the car while I was holding the garage door open."

Student: "I'd like to buy two tickets to the show."

Ticket-seller: "We have only two standing room tickets left."

Student: "Are they together?"

Physician: "Lady, if you want a health examination you'll have to remove your blouse."

"Kitty: "Oh, my no, doctor!"

Physician: "Come, come! Don't make mountains out of mole hills."

Santa Monica Lady: "Doctor, is there anything wrong with me?"

Doctor: "Yes, but it's trifling."

Lady: "Oh, I don't think that's so very wrong, is it?"

"That school turns out some great men."

"When did you graduate?"

"Didn't. I was turned out."

With prices going down, some bathing suits may now be bought for a ridiculous figure.

Sign on a Hollywood street corner: "To avoid that run-down feeling, cross the street carefully!"—Tales of Hoffman.

Polly was applying for the position of maid where the mistress was very particular.

"Have you any references?" she was asked.

"Oh, yes, ma'm, lots of them," replied Polly.

"Then why didn't you bring them with you?" she was asked.

"Well," the maid explained, "to tell you the truth, they're like my photographs—none of them do me justice."

A swing-shifter had looked long and fruitlessly for a room, and finally saw a sign on a house: "Apartment to let." He was shown what the accommodations were by a very pretty servant girl.

He: "Are you a part of the apartment?"

She: "No, sir. The apartment is 'to let,' but I am to be let alone."

First wife: "I'm going to take my fur coat down and put it in cold storage."

Second wife: "That's a winderful idea—it keeps them from losing their hair, getting spoiled, and nobody can steal them."

First wife: "Yeah, sometimes I wish I could put my husband in there for a few months."

First Clerk: "Poor old Watkins has lost his hearing. I'm afraid it may lose him his job."

Second Clerk: "Nonsense. The management is transferring him to the complaint department."

JENSEN - Leader for 29 Years

The first Jensen, built 29 years ago, gave producers a pumping unit unrivaled for capacity and ease of operation. Today, with seasoned engineering know-how, skilled craftsmanship, and over a quarter a century of practical experience back of Jensen pumping units, they still retain their position of leadership in the field.

Jensens have proved themselves to be rugged, efficient performers that will stand up and produce dependably, with a minimum of maintenance, a maximum of output.

Your Jensen dealer will gladly give you facts and figures on Jensen's economy of performance, or write to Coffeyville for free literature. Do it today.

Stocked by
THE OIL TOOL CORPORATION
3075 Cherry Ave., Long Beach, Calif.
Phone 481-81

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COFFEYVILLE, KANSAS, U.S.A.
EXPORT OFFICE: 50 Church St., New York City

National Tank Company Houses New Production In Five-Acre Plant

National Tank Company, Tulsa, Oklahoma, pioneer oil field tank and production equipment manufacturers, announce the opening of a new welding production plant which comprises over five acres under roof.

The new facilities now permit the manufacture of much larger vessels of higher working pressure for gasoline extraction, refining, gas processing, chemical processing and other lines, in addition to all the present National Tank products.

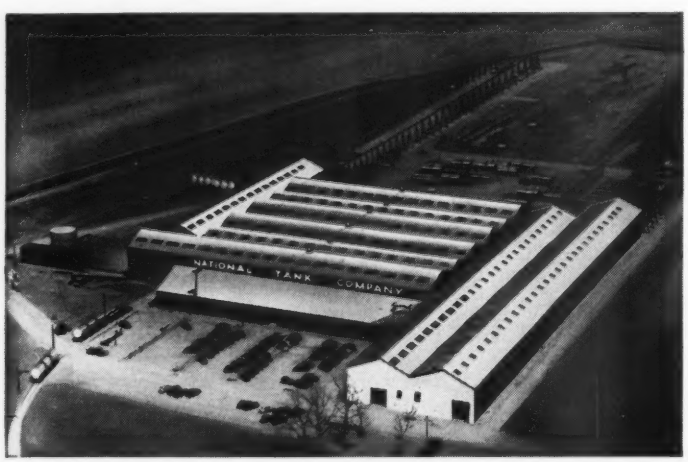
Special equipment has been installed, including two 50-ton cranes, seven 5-ton cranes, six 10-ton cranes and a 400-ton hydraulic press. The huge new annealing furnaces up to 15′ x 15′ x 80′ would accommodate Pullman cars. There are also 2½″-capacity plate bending rolls and equipment to X-ray steel up to twenty inches thick.

New products to be manufactured in the new National plant will include fractionating and refinery columns; bubble, absorber, distillation and stabilizer towers; chemical tanks of all kinds, debutanizers, depropanizers, vacuum stills and many other refining and chemical processing units.

The plant is located on a 36½-acre site.

National Tank Company was organized in 1926 with a small shop, twelve employees and two field branches. Today, it has 800 employees, 33 field warehouses and field service branches in 13 states and Canada.

National Tank president is J. P. Walker and vice-presidents and directors include C. G. Wells, S. S. Parker and C. O. Glasgow.



The New National Tank Plant

White Introduces New Type Truck

Key men and distributors of The White Motor Company's Pacific Coast organization have just returned from Cleveland where they attended an important sales conference which was the kick-off meeting in White's campaign for their totally different new type of truck, the White Super Power 3000 series. Thirty-seven men from the Pacific Coast made the trip to Cleveland and many of the distributors made the return journey in what amounted to a mass drive-away of these new models.

According to Wilson D. Patterson, White's Pacific Coast Regional Manager, this meeting marks the most important motor truck advance in years for with the model 3000 he believes that White has the complete answer in every engineering detail to the problem of getting more payload delivery per working day at a new low cost per unit of delivery.

This new 3000 series is now on display at all West Coast branches and distributors, Mr. Patterson added.

Bowen Automatic Flow Control

The Bowen Automatic Flow Control is a completely new and revolutionary device for producing wells. It is installed on the flow line at the well head and brings to operators many desirable features that were previously unobtainable. Extensive field tests have shown that the Bowen Automatic Flow Control:

1. Automatically controls production.
2. Automatically prevents excessive loading.
3. Permits positive regulation at the lowest possible gas-oil ratio.
4. Reduces paraffin problems to a minimum.
5. Automatically controls gas surges.

Bowen Automatic Flow Controls are economical in price, easy to install, and simple to operate.

Construction And Operation

Bowen Automatic Flow Controls consist essentially of a Body, a spring-loaded Valve, and an adjustable Orifice Plate. The Body provides the connections to the flow lines; the spring loading on the Valve is controlled by adjusting the Tube Cap; the amount that the Valve can open is controlled by adjusting the Mandrel; the desired orifice in the Orifice Plate is selected by adjusting the Stem Handle.

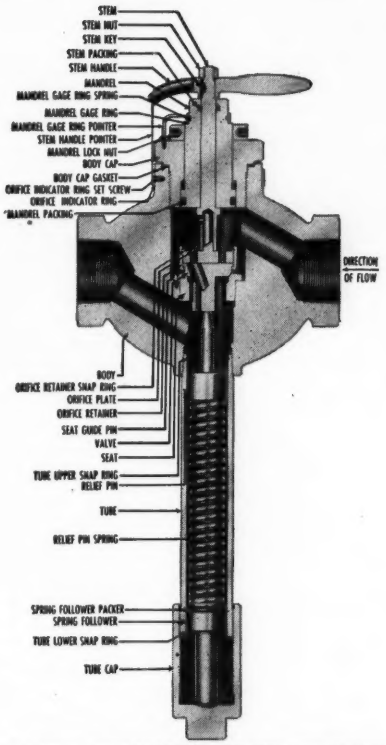
Upon installation, it is necessary to adjust the spring loading and the valve opening and to select the proper orifice to meet the particular conditions of the well. After a very short test period, the initial settings can with ease be adjusted to the exact requirements.

Flowing Wells

With a Bowen Automatic Flow Control in place and with the Relief Pin Spring adjusted so that normal pressure will hold the Valve against the Seat, fluid enters the Body as indicated on the illustration. It flows through the upper port of the Body into the upper chamber, down through the Orifice Plate and Valve and out the lower port of the Body. When the pressure drops below the setting of the Relief Pin Spring, the Valve automatically raises and allows fluid to flow between the Valve and the Seat as well as through the Orifice Plate. Thus constant and uniform flow is insured despite low-pressure intervals. In addition, the automatic raising of the valve during a low-pressure interval prevents excessive fluid loading from killing the well because the excessive fluid load is automatically dissipated at a desired volume and velocity. It is obvious, therefore, that through proper setting of the Relief Pin Spring and through proper selection of orifice in the Orifice Plate, the lowest possible gas-oil ratio is automatically maintained. The uniform control that is automatically maintained prevents rapid gas expansion and this is a great deterrent factor in the formation of paraffin on the tubing walls.

Pumping Wells

With a Bowen Automatic Flow Control in place and with the Relief Pin Spring adjusted so that under normal pressure the Valve is held off the Seat, fluid enters the Body as indicated in the illustration. It flows through the upper port of the Body into the upper chamber, down through the Orifice Plate and Valve and between the Valve and the Seat and out the lower port of the Body. When the pressure rises above the setting of the Relief Pin Spring, the Valve automatically lowers against the Seat and the fluid can then pass only through the restricted orifice in the Orifice Plate. Thus, a sudden surge of gas cannot blow the hole dry and gas-locked



BOWEN AUTOMATIC FLOW CONTROL PATENT PENDING

pumps are avoided. In addition, the uniform control that is automatically maintained reduces sand and paraffin problems to a minimum.

Typical Example

The well was loading with oil and some water. In order to flow the well, it was necessary to manually change beans every four hours and flow the well through a 30/64 bean most of the time with a resultant gas-oil ratio 1400 M Cu. Ft. and at a rate of 550 barrels per day. When a 25/64 bean was installed, the well overloaded and died.

The well was then swabbed in, and a Bowen Automatic Flow Control was installed, orifice set at 18/64, and spring tension was set to cause Valve to rise from Seat at 200 pounds pressure; at this pressure the well was relieved of excessive overload by means of flowing between Valve and Seat. When excessive load was disposed of, the well pressure became greater, causing the Valve to seat at 340 pounds pressure, thus causing the well to again flow through 18/64 orifice, top well pressure going for a short time at 415 pounds. In this manner the well was caused to flow partially loaded at all times. Result was as follows—350 barrels per day with resulting gas-oil ratio of 270 M Cu. Ft. gas.

Accessory Equipment

Pressure Recorders are recommended accessory equipment for Bowen Automatic Flow Controls. They assist the operator in the proper setting of the unit and the charts will indicate when adjustments are necessary. An outlet is provided in the Body for installation of a Pressure Recorder.

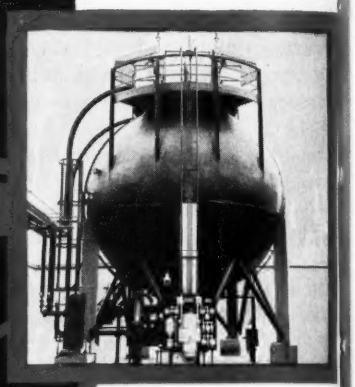
Hughes to Release New Technical Bulletin

Soon to be released by the Hughes Tool Company is a new technical manual titled "Care and Operation of Tool Joints and Drill Collars." "The purpose of this booklet," as explained by M. E. Montrose, Hughes vice president in charge of sales, "is to provide the industry with a practical handbook which we hope will prove of assistance in eliminating unnecessary tool joint troubles." The brochure is not of an advertising nature, but rather a factual presentation of the tool joint and drill collar failures most likely to worry the present-day operator. The most satisfactory methods of reducing these troubles are the conclusions drawn by the Hughes staff of tool joint experts through engineering and field research over a period of years.

In its foreword, "Care and Operation of Tool Joints and Drill Collars" points out that since modern advances in tool joint design and construction have in such large measure eliminated the former failures of tool joint to drill pipe connection, the text of the book deals fully with tool joint troubles in pin and box connection. The operational practices which will eliminate the common causes of pin and box failure are discussed at length.

A general idea of the book's content may be realized by a review of the subjects covered . . . "Breaking In" New Tool Joints, General Operating Recommendations, Galling or "Freezing," "Wobbles," Operational Damage, O. D. Wear, Operation under Extreme Torque Conditions, and Repair of Damaged Tool Joints. Since all of the recommendations which are made for the care of tool joint connections can be applied to the drill collar, only those points which merit special attention

PETRECO *Electric* DESALTING *Service Everywhere*



Petreco Electric Desalters are in use wherever salty crudes are a refining problem. The Petreco service organization is set up to render quick service and replacement parts whenever needed.

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•

648 Edison Building
Toledo 4, Ohio

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530 West Sixth Street
Los Angeles 14, California

PETRECO

SPECIALIZED *Electric* PETROLEUM PROCESSES { DESALTING / DEHYDRATING

are discussed separately. These are taken up in the last three pages of the book.

"Care and Operation of Tool Joints and Drill Collars" is written in the language of the drilling industry; the purely technical engineering terms have been kept at a minimum and each recommendation and condition is described clearly and thoroughly. The reason behind the conclusions arrived at are explained understandably. Accurate photographs provide helpful illustrations and accompany each point or process dealt with.

Even a quick glance reveals that the Hughes Tool Company has not spared time or expense to produce this comprehensive and timely booklet. Its thirty-eight pages are attractively laid out and profusely illustrated in a clear and graphic manner. Durably bound, it will prove equally acceptable on the desk of a drilling superintendent or in the knowledge box of any dog house.

If you would like a copy of "Care and Operation of Tool Joints and Drill Collars," send a card or letter to the Hughes Tool Company, Post Office Box 2539, Houston 1, Texas. There is, of course, no charge or obligation.

Pelton Announces New Pumping Jack

The Pelton Water Wheel Company, Los Angeles, announces the production of a new heavy duty long stroke hydraulic pumping jack, the Series "C-P." According to Wm. F. Boyle, vice president and general manager, the Series "C-P" complements the present Series "A" and Series "A-P."

Designed for extra-heavy duty, the Series "CP" is available to the oil pumping industry.

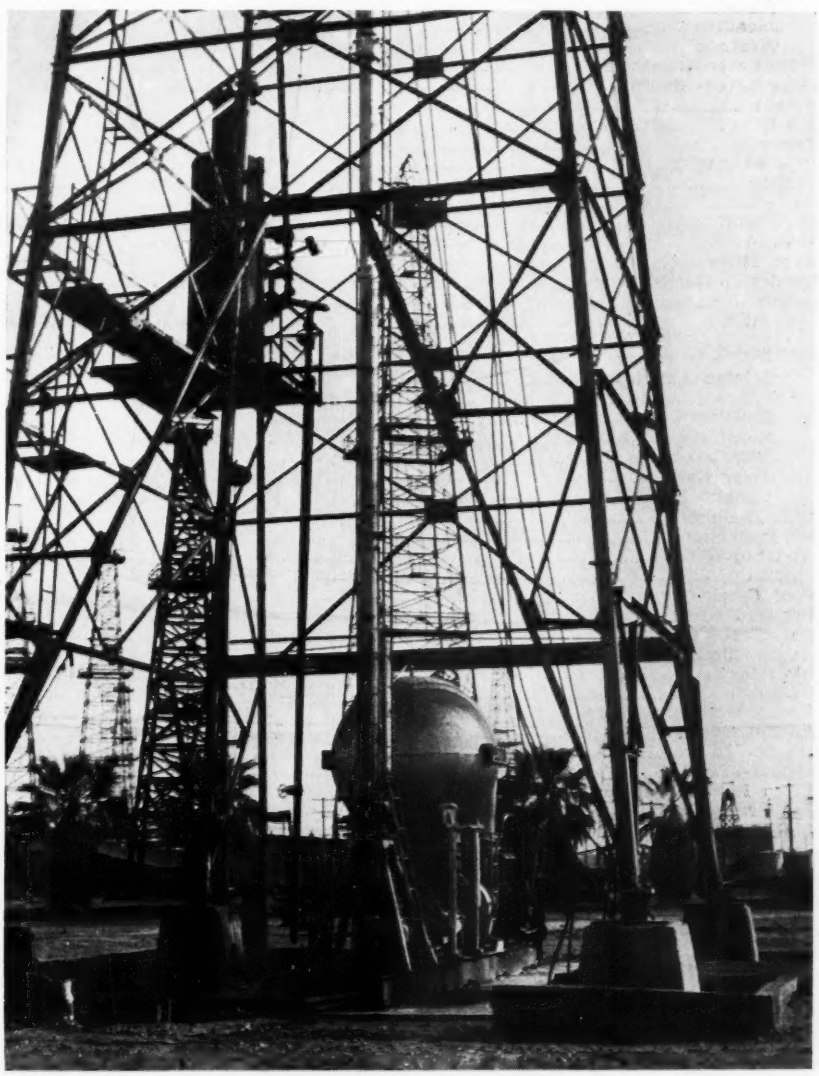
Designed for extra heavy duty, the Series "C-P" is available in polished rod load ratings to 40,000 pounds, load range ratings to 27,000 pounds, stroke lengths to 30 feet and polished rod travel to 350 ft./-min. An unusual feature of the Series "C-P" is the use of a spherical balance tank in place of the conventional cylindrical balance tank. Mounted directly over the hydraulic pump, the new tank design provides the utmost in compactness and utility.

The Series "C-P" retains certain field-proven Pelton design features, such as: Unitized skid mounting, making it unnecessary to break the hydraulic circuit when moving the unit on or off the well; direct drive; an accumulator to maintain complete sucker rod stress control; automatic cooling system; pump spacing adjustment; piston type scavenger pump and many other features found on all Pelton "Pelican" Jacks. For detailed information write The Pelton Water Wheel Company, 2447 E. 54th St., Los Angeles, California.

Appeal of the Independent Petroleum Association of America for the imposition of added import duties on oil has been turned down by the Federal Tariff Commission.

West Edison Well Pumping

The first drilling effort of Morris-Rothschild Operations has been completed at West Edison. The well, Brandt No. 1 on Sec. 22-30s-29e, at last reports was pumping 50 barrels a day. The project was bored to an original bottom of 3527 ft. and whipstock set at 2832 ft. for a redrill to 3036 ft. Collapsed liner prompted the redrilling. The well is on a 160-acre lease and it proves up a northeast extension of the West Edison field.



The New Pelton Heavy Duty Pumping Jack

California Oil World's Monthly Summary

CALIFORNIA DEVELOPMENT AND PRODUCTION

	MARCH, 1949, DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 3 Months	Daily Average March 1949	Daily Average March 1948
SAN JOAQUIN VALLEY REGION						
Ant Hill	1				982	1,188
Antelope Hills					1,303	1,216
Bellevue					265	309
Belridge—North					3,406	3,694
Belridge—South	7	15	275	29	7,517	6,229
Blackwell's Corner					123	129
Buena Vista	1	2	109	4	43,728	46,066
Canal					1,828	2,019
Coalinga Group						
Eastside	3	3	94	14	19,412	18,529
Oil City					62	89
Coalinga—Nose					48,695	53,439
Coalinga—Northeast					7,878	9,347
Guijarral Hills	6	2	1840	8	4,096	
Pleasant Valley				1	3,787	3,576
Jacalitos	2	1	56	2	6,894	5,268
Westside	1	10	164	13	6,200	6,819
Coles Levee—North	4			2	16,839	16,102
Coles Levee—South					2,774	3,119
Edison	2	5	918	14	12,118	10,833
Elk Hills	8	3	924	4	7,813	7,456
Fruitvale	1	2	128	4	7,159	6,653
Gosford, East	1	2	420	4	676	
Greeley				1	14,181	14,025
Helm					2,804	4,079
Kern Bluff	2	5	245	19	2,829	527
Kern Front					7,698	9,197
Kern River	8	3	76	22	12,449	12,062
Kettleman North Dome	1	1	81	2	33,432	36,187
Lanare					1,150	1,505
Lost Hills	1			2	7,408	6,914
McKittrick Group						
Belgian Anticline	1			1	1,553	1,102
Cymric	2	2	49	2	9,875	19,229
McKittrick					2,762	2,744
McKittrick Front					1,078	1,727
Salt Creek					4,705	6,094
Sheep Springs					829	1,096
Temblor Ranch				1	88	108
Midway-Sunset	4	12	468	32	40,313	41,827
Mt. Poso Group		4	343	7	12,106	12,906
Mountain View	1			2	3,187	3,839
Paloma	5	1	401	4	12,855	10,605
Poso Creek Group				1	2,554	3,613
Pyramid Hills					201	230
Race Track Hill					1,984	1,889
Raisin City		1	125	4	3,178	2,785
Rio Bravo					12,156	12,065
Riverdale					2,378	3,407
Round Mountain Group	1			4	7,173	7,697
Russell Ranch	10	8	7,843	25	16,080	29
Strand					646	725
Strand—East					399	497
Tejon Ranch	1				2,567	3,275
Ten Section	1			1	6,529	7,239
Union Avenue					203	264
Wasco					58	161
Wheeler Ridge				3	774	216
Other Fields	6	2	245	9	1,702	1,425
TOTAL—San Joaquin Valley Region	81	84	14,804	241	433,439	433,332
COASTAL REGION						
Santa Maria District						
Barham Ranch (Los Alamos)						11
Casmalia					1,003	1,051
Cat Canyon—East					499	350
Cat Canyon—West	3	3	970	8	17,371	14,211
Four Deer				1	626	611
Gato Ridge	2				3,474	3,734

	MARCH, 1949, DEVELOPMENT				PRODUCTION	
	Active Drilling Wells	Oil Wells Completed	Initial Production B/D	Oil Wells Completed First 3 Months	Daily Average March 1949	Daily Average March 1948
COASTAL REGION—Continued						
Guadalupe	.....	.....	.....	2	70	.....
Lompoc	.....	.....	.....	.....	1,245	6,311
Olivera Canyon	1	.....	.....	1	1,025	182
Orcutt	1	2	45	7	4,643	4,979
Santa Maria Valley	1	.....	.....	1	17,713	21,171
Tinaquaic	.....	.....	.....	.....	26	.....
Zaca Creek	1	1	274	3	3,682	840
Santa Barbara District						
Capitan	.....	.....	.....	.....	2,063	2,794
Coal Oil Point	1	.....	.....	.....	.....	.....
Elwood	.....	1	240	2	7,832	7,216
Santa Barbara	1	.....	.....	.....	64	61
Summerland	.....	.....	.....	.....	23	2
Ventura District						
Montalvo West	.....	2	372	2	873	153
Padre Canyon	1	4	1,371	8	7,384	5,118
Rincon	1	1	51	2	3,097	3,267
San Miguelito	1	3	387	4	5,953	5,529
Ventura Avenue	13	7	3,957	15	57,257	50,760
North Santa Clara Valley District						
Del Valle	2	2	269	5	9,462	9,589
Hopper Canyon	.....	.....	.....	.....	133	179
Oak Canyon	.....	.....	.....	.....	1,785	2,089
Ojai Group	1	2	231	6	884	505
Sespe Canyon Group	.....	.....	.....	2	225	228
Temescal	.....	.....	.....	.....	519	559
Others	.....	.....	.....	1	66	56
South Santa Clara Valley District						
Aliso Canyon	3	.....	.....	1	3,348	3,386
Bardsdale	1	.....	.....	5	1,500	642
Newhall-Potrero	3	2	537	5	8,908	7,004
Oxnard	.....	.....	.....	.....	1,157	1,544
Placerita Canyon	5	9	961	23	1,515	.....
Shiells Canyon	.....	.....	.....	.....	918	992
South Mountain	3	3	610	9	6,524	5,246
West Mountain	1	.....	.....	1	747	1,010
Others	.....	.....	.....	.....	813	827
Miscellaneous	4	8	819	16	2,804	158
TOTAL—Coastal Region	50	50	11,094	130	177,231	162,365
LOS ANGELES REGION						
Brea-Olinda	5	2	160	6	15,437	13,793
Coyote—East	.....	2	285	5	5,140	4,704
Coyote—West	4	2	311	6	13,836	15,612
Dominguez	1	.....	.....	1	13,382	13,909
Dominguez, East	.....	.....	.....	.....	21	23
Dominguez, Southeast	.....	1	272	2	308	52
East Los Angeles	1	.....	.....	1	1,243	1,268
El Segundo	.....	.....	.....	.....	318	375
Huntington Beach	7	8	1,139	25	60,224	56,044
Inglewood	2	3	569	8	13,580	11,269
Lawndale	.....	.....	.....	.....	1,036	311
Long Beach	8	2	772	3	23,055	23,359
Montebello	3	.....	.....	4	6,751	6,934
Newport	1	.....	.....	.....	6,727	6,677
Playa Del Rey	.....	.....	.....	.....	1,800	1,937
Potrero	1	2	292	3	1,246	1,243
Richfield	2	3	112	5	6,317	6,314
Rosecrans-Athens Group	6	2	359	4	5,330	4,671
Santa Fe Springs	2	.....	.....	.....	14,782	15,884
Seal Beach	1	2	2,350	3	12,242	11,339
Torrance	1	1	30	3	7,735	7,855
Whittier	1	.....	.....	.....	894	977
Wilmington	13	6	2,233	40	125,229	136,554
Yorba Linda	.....	.....	.....	1	973	901
Other Fields	3	.....	.....	2	1,461	1,788
TOTAL—Los Angeles Region	62	36	8,884	122	339,067	343,793
EXPLORATORY						
Outpost Wells	49	.....	.....	.....	.....	.....
Wildcats	13	.....	.....	.....	.....	.....
Gas Wells	2	2	Gas	4	.....	.....
Abandoned Drilling Wells	.....	38	.....	139	.....	.....
TOTAL CALIFORNIA	257	210	34,782	636	949,737	939,490

Macco Corporation Buys Signal Pipe Line Construction Co.

The Signal Pipe Line Corp., a subsidiary of the Macco Corporation, has recently effected an outright purchase of the Signal Pipe Line Construction Co., a company which has been actively engaged in the construction of utility and oil pipe lines througout the Southern California area for the past twenty years.

B. M. Laulhere will head the new Signal Pipe Line Corp. as Vice-President and General Manager. Laulhere has been connected with the pipe line industry for many years.

Of the three partners operating the predecessor company, James Kitt, Jack Robertson and L. L. Bendinger, only the latter continues with the new management in the capacity of Office Manager and Assistant Secretary.

Other officers are John MacLeod, President; F. E. Cornwall, Vice-President; Fred H. Brown, Vice-President and Treasurer, and W. B. von KleinSmid, Secretary. These officers hold similar offices in Macco Corporation.

Macco is engaged primarily in oil field and general construction work and through its divisions also produces and sells oil well drilling fluids, lumber and crushed rock. Through other subsidiaries it also engages in dredging along the Pacific Coast and oil field construction in foreign countries.

Oil For the People

The wonders of the oil industry are as spectacular as the atomic secrets.

Oil propelled our ships and machines and high-octane gasolines flew our planes that won the war. The atomic bomb was introduced at a time when the enemy was softened for the final assault. Actually it was not the atom bomb that won World War II. Oil and the men who fought the war were deciding factors.

Whether atomic power will be used in a war of the future is anyone's guess. What is important now is the fact that the oil industry is one of the country's leading industries in the development of a natural resource from which all civilians benefit. There are no multi-billion dollar secret plants involved in the production of petroleum and its "thousand and one" products.

If oil had been discovered as an energy source in the twentieth century it would probably be engulfed in secrecy as a government monopoly instead of being a thriving industry for peace as well as war. Its use by the public would await the pleasure of government.

It is fortunate for the private citizen that oil was discovered before governments deemed it necessary to monopolize the development of new energy sources. As it is, people are able to enjoy oil products that come from a free competitive system of industry.

NEW PUSH-BUTTON FACTORY FOR OIL PRODUCTS—General view of Standard of California's huge new Packaging and Grease Plant at Richmond. Installation covers 7½ acres and handles virtually every packaged product of the company. These range from pharmaceutical white oils to heaviest greases. Area in right foreground shows a portion of the truck loading docks. Heavy barrels are delivered on mile-long conveyor system to trucks. Conveyor system is electronically controlled from small central booth.

Cuyama Valley Adds Interest

Richfield Oil Corporation has completed its Ritter A No. 33-2 well on the Russell Ranch for a yield of 816 barrels of 33.5 gravity oil a day from 3114 ft. In the new South Cuyama field, where Richfield some weeks ago completed the Homan well, the company is drilling Hibbert No. 11-36 on Sec. 36-10n-17w below 4100 ft. Superior Oil's Buzard No. 18-25 on Sec. 25-10n-27w is drilling at 4150 ft. Southern California Petroleum's Joice No. 1 on Sec. 25-11n-28w on the Russell Ranch is drilling ahead at 3978 ft. It is a northerly offset to Hancock's Wood-Callahan No. 11-25 producer. Made up originally of Spanish and Mexican grants, property in Cuyama Valley figured in one of the final official acts of Pio Pico, California's last Governor under the flag of Mexico. On January 4, 1846, he signed a grant of considerable acreage to Don Cesairo Lataillada. Bolsa Chica Oil Corporation is starting Hickey No. 1 on Sec. 30-9n-24w in Cuyama Valley. Location falls 14 miles south of the South Cuyama field.

A lubricating system set up for operation of the vast assembly of construction equipment in use on the $111,000,000 Davis Dam project on the Colorado River was the subject of a two-day inspection, May 24-25, by General Petroleum engineers, who serve as contractor representatives. The system was devised jointly by engineers of the Utah Construction Company, the contractor for the dam, and General Petroleum lubrication engineers for Southern California. Those on the inspection visit were D. C. Hopper, Seattle; L. J. Shannon, Portland; D. C. Tait, San Francisco, and J. T. Hanafin, Los Angeles. The latter, with James Bly, lubrication engineer on the job, worked with the contractor's engineers who contrived the system.

Loffland Bros. Company, contractor, is drilling Sunray Oil's Johnson No. 44 in the Lawndale field. Among Loffland's many jobs are 10 at Wilmington for Union Pacific Railroad.

Why drillers prefer "OILWELL" Rotaries

1. They have what it takes to do the job!

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SERVICE RATINGS

"OILWELL" ROTARIES	17½-C	17½-D	20½"	21-A	27½-B
Rated Supportable Dead-Load Capacity . . . tons	200	200	250	300	350
Maximum Recommended Drill-Depth . . . . feet	9,000	9,000	13,000	17,000	17,000
Maximum Recommended Table Speed . . . r.p.m.	500	500	500	1000	500
Gear Ratio	3.28:1	3.28:1	3.82:1	2.61:1	3.84:1

Let your nearest "Oilwell" representative point out the many improved construction features of "Oilwell" Rotaries. They are your assurance of easy maintenance and long, trouble-free performance.

"OILWELL" 27½-B OILBATH ROTARY . . . is designed for drilling depths to 17,000 feet and for drilling speeds to 500 r.p.m., with a full 27½-inch cylindrical table opening to permit the running of large casing sizes.

"OILWELL" 21-A SUPER-SPEED ROTARY . . . will perform satisfactorily at any desired speed to 1,000 r.p.m., and is conservatively rated for drilling depth to 17,000 feet. Cylindrical table opening is full 21 inches in diameter.

"OILWELL" 20½-INCH OILBATH ROTARY . . . has a cylindrical table opening of a full 20½ inches in diameter. This rotary is designed for drilling depths to 13,000 feet and for maximum drilling speeds to 500 r.p.m.

"OILWELL" 17½-C and 17½-D OILBATH ROTARIES . . . are designed for shallow to medium drilling depths of 9,000 feet and for drilling speeds to 500 r.p.m. Both the 17½-C and 17½-D have full cylindrical table opening of 17½ inches.

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